



**US Department of the Interior
Bureau of Land Management
Carson City District, Nevada**

Draft Resource Management Plan and
Environmental Impact Statement



VOLUME 2: CHAPTER 4

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It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

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ACRONYMS AND ABBREVIATIONS

Full Phrase

ACEC	area of critical environmental concern
AML	Appropriate Management Level
AMP	Allotment Management Plan
AMS	Analysis of the Management Situation
APN	Assessor's parcel number
AQRV	air quality related value
AUM	animal unit month
BCB	Back County Byway
BCR	Bird Conservation Regions
BCWCA	Back Country Wildlife Conservation Areas
BLM	US Department of the Interior, Bureau of Land Management
BMP	best management practice
°C	degrees Celsius
CARB	California Air Resources Board
CBR	Central Basin and Range
CCD	US Department of the Interior, Bureau of Land Management, Carson City District
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CHP	cultural/historic
CO	carbon monoxide
CO ₂	carbon dioxide
COA	condition of approval
CRMP	consolidated resource management plan
CSU	controlled surface use
CTTM	comprehensive travel and transportation management
DOI	US Department of the Interior
EA	environmental assessment
EIS	environmental impact statement
EPA	US Environmental Protection Agency
ERMA	Extensive Recreation Management Area
ESR	emergency stabilization and rehabilitation
°F	degrees Fahrenheit
FLPMA	Federal Land Policy and Management Act
FMU	fire management unit
Forest Service	United States Department of Agriculture, National Forest Service
FRCC	fire regime condition class
GIS	Geographic Information System
GPRA	Government Performance and Results Act
GRSG	Greater Sage-Grouse
HA	herd area

HMA	Herd Management Area
IM	Instruction Memorandum
LAC	limits of acceptable change
LUP	land use plan
LUPA	land use plan amendment
Ma	megaannum
MOU	Memorandum of Understanding
NAAQS	National Ambient Air Quality Standards
NAC	Nevada Administrative Code
NAS	US Department of Defense, Naval Air Station
National Register	National Register of Historic Places
NDEP	Nevada Department of Environmental Protection
NDOW	Nevada Department of Wildlife
NDWR	Nevada Division of Water Resources
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NHT	National Historic Trail
NNHP	Nevada Natural Heritage Program
NO ₂	nitrogen dioxide
NPS	US Department of the Interior, National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRS	Nevada Revised Statute
NSO	no surface occupancy
NV IBA	Nevada Important Bird Areas
NWIS	National Water Information System
NWSRS	National Wild and Scenic Rivers System
O ₃	ozone
OHV	off-highway vehicle
ORV	outstandingly remarkable values
PFC	Proper Functioning Condition
PFYC	Potential Fossil Yield Classification
PGH	preliminary general habitat
PGMA	preliminary general management area
PILT	Payments in Lieu of Taxes
Planning Area	Carson City District Resource Management Plan Planning Area
PM ₁₀	particulate matter with an aerodynamic diameter of 10 microns or less
PM _{2.5}	particulate matter with an aerodynamic diameter of 2.5 microns or less
ppb	parts per billion
PPH	preliminary priority habitat
ppm	parts per million
PPMA	preliminary priority management area
R&PP	Recreation and Public Purposes Act

RAC	Resource Advisory Council
RDF	required design features
REA	Rapid Ecological Assessment
Reclamation	US Department of the Interior, Bureau of Reclamation
RHA	Rangeland Health Assessments
RMIS	Recreation Management Information System
RMP	resource management plan
RMZ	recreation management zone
ROS	Recreation Opportunity Spectrum
ROW	right-of-way
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO ₂	sulfur dioxide
SRMA	Special Recreation Management Area
SRP	Special Recreation Permit
Standards and Guidelines	Nevada Standards for Public Land Health and Guidelines for Livestock Grazing Management
TA	Target Areas
TCP	traditional cultural property
TL	timing limitations
TMA	travel management area
US	United States
USC	United States Code
USDA	US Department of Agriculture
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
VRM	Visual Resource Management
WEG	Wind Erodibility Group
WHB	wild horse and burro
WSA	wilderness study area
WSR	wild and scenic river
WUI	wildland-urban interface

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Chapter 4

Environmental Consequences

CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

Chapter 4, Environmental Consequences, presents the direct, indirect, and cumulative environmental, social, and economic impacts on the human and natural environment that are projected to result from implementing the alternatives presented in **Chapter 2**. Irretrievable or irreversible commitment of resources and unavoidable adverse impacts are presented at the end of the chapter.

Impact analyses and conclusions are based on interdisciplinary team knowledge of the resources and planning area, information provided by experts in the BLM, other agencies' monitoring data, and information contained in pertinent literature. The baseline used for the impact analysis is the current condition or situation, as described in **Chapter 3**, Affected Environment. Analysis assumptions have also been developed to help guide the determination of effects (see **Section 4.1.1**, Analytical Assumptions). Because the Draft Resource RMP/EIS provides a broad management framework and exact locations of development or management are often unknown, the analysis in this chapter presents best estimates of impacts. Impacts are quantified to the extent practical with available data. In the absence of quantitative data, best professional judgment provides the basis for the impact analysis.

The land use planning-level decisions that the BLM is making with this RMP are programmatic decisions based on analysis that can only be conducted on a broad scale. Because of the broad scope, impact analysis of planning-level decisions is speculative with respect to projecting specific activities. Subsequent documents tiered to this RMP would generally contain a greater level of detail and would be subject to the NEPA analysis and compliance process. Subsequent tiered activity- and project-level plans are more definitive than plans found in an RMP. An activity plan typically describes projects in detail that would lead to on-the-ground action and focuses on single resource programs. Activity plans, such

as travel management plans, are generally more site-specific and less speculative than the RMP analyses. A project-specific plan is prepared for a project or several related projects. Project-level plans, such as stream restoration plans, contain specific proposed actions, and site- or area-specific analysis is conducted. Activity plans may contain information that is as detailed or specific at a project level.

4.1.1 Analytical Assumptions

Several assumptions were made to facilitate the estimation of the effects of the alternatives. These assumptions are made only for the purpose of analysis and do not represent potential RMP decisions. The assumptions do provide reasonably foreseeable projected levels of development that could occur within the planning area. These assumptions should not be interpreted as constraining or redefining the management objectives and actions proposed for each alternative described in **Chapter 2**. The following are general assumptions applicable to all resource categories. Any specific resource assumptions are provided in the *Methods of Analysis* subheading for that resource.

- Sufficient funding and BLM personnel will be available for implementing the final decision.
- Implementing actions from any of the RMP alternatives will comply with all valid existing rights, federal regulations, BLM policies, and other requirements.
- Implementation-level actions necessary to execute the land use plan-level decisions in this RMP will be subject to further environmental review, including the NEPA, as appropriate. However, the RMP/EIS provides the necessary NEPA analysis for some large-scale implementation decisions, including the issuance of leases for fluid minerals such as oil, gas, and geothermal resources.
- Local climate patterns of historic record are expected to remain similar for the planning period of the RMP; related conditions for plant growth may show variability (e.g., extreme winter or summer or extended fire seasons) during the same time period.
- Stipulations will apply, where appropriate, to all surface-disturbing activities (and occupancy) associated with land use authorizations, permits, and leases issued on BLM-administered lands. The BLM administers 4.8 million surface acres within the decision area. Stipulations also apply to fluid mineral leasing on lands overlying federal mineral estate, which includes federal mineral estate underlying BLM-administered lands, privately owned lands, and state-owned lands.
- The functional capability of all developments will be maintained.
- The discussion of impacts is based on the best available data. Knowledge of the planning area and professional judgment, based on

observation and analysis of conditions and responses in similar areas, are used to infer environmental impacts where data are limited.

- Acreage figures and other numbers used in the analyses are approximate projections for comparative and analytic purposes only. Readers should not infer that they reflect exact measurements or precise calculations.
- Acreages were calculated using GIS technology, and there may be slight variations in total acres between resources. These variations are negligible and will not affect analysis.

4.1.2 General Methodology for Analyzing Impacts

Direct, indirect, and cumulative impacts are considered in this effects analysis, consistent with direction provided in 40 CFR 1502.16.

- *Direct impacts* are caused by an action or implementation of an alternative and occur at the same time and place.
- *Indirect impacts* result from implementing an action or alternative but are usually later in time or removed in distance and are reasonably certain to occur.
- *Cumulative effects* are defined in **Section 4.2**, Cumulative Impacts.

Effects are quantified where possible using GIS and other applications. In the absence of quantitative data, best professional judgment prevailed; impacts are sometimes described using ranges of potential impacts or in qualitative terms. Only management programs with impacts are discussed. The standard definitions for terms referring to impact duration that are used in the effects analysis are as follows, unless otherwise stated:

- *Short-Term Effect*: The effect occurs only during or immediately after implementation of the alternative. For the purposes of this RMP, short-term effects would occur during the first 5 years.
- *Long-Term Effect*: The effect could occur for an extended period after implementing the alternative. The effect could last several years or more and could be beneficial or adverse. For the purposes of this RMP, long-term effects would occur beyond the first 5 years and perhaps over the life of the RMP.

For ease of reading, impacts presented are direct, long-term, and occur within the larger planning area unless they are noted as indirect, short-term/temporary, or localized. Analysis shown under Alternative A may be referenced in the other alternatives with such statements as “impacts would be the same as or similar to, Alternative A” or “impacts would be the same as Alternative A, except for . . .” as applicable.

4.1.3 Incomplete or Unavailable Information

The CEQ established implementing regulations for the NEPA requiring that a federal agency identify relevant information that may be incomplete or unavailable for an evaluation of reasonably foreseeable significant adverse effects in an EIS (40 CFR 1502.22). If the information is essential to a reasoned choice among alternatives, it must be included or addressed in an EIS. Knowledge and information is and would always be incomplete, particularly with infinitely complex ecosystems considered at various scales.

The best available information pertinent to the decisions to be made was used in developing the RMP. Considerable effort has been taken to acquire and convert resource data into digital format for use in the plan—both from BLM sources and from outside sources.

Certain site-specific information was unavailable for use in developing this plan, usually because inventories have either not been conducted or are not complete. Some of the major types of data that are incomplete or unavailable include the following:

- Field inventory of cultural resources
- Field inventory of paleontological resources
- Field inventory of vegetation composition
- Field inventory of soils and water conditions
- Field inventory of wildlife and special status species occurrence and condition
- Filed inventories for riparian and wetland areas
- Field inventories for non-native species, invasive species or noxious weeds

The BLM has information to support planning-level decisions, although the data is incomplete for specific areas. For these resources, estimates were made concerning the number, type, and significance of these resources based on previous surveys and existing knowledge. In addition, some impacts cannot be quantified given the proposed management actions. Where this gap occurs, impacts are projected in qualitative terms or, in some instances, are described as unknown. Subsequent project-level analysis will provide the opportunity to collect and examine site-specific inventory data required to determine appropriate application of RMP-level guidance. In addition, ongoing inventory efforts by the BLM and other agencies in the planning area continue to update and refine information used to implement this plan.

Impacts on climate change from allowable uses on BLM-administered lands and impacts on resources resulting from a changing climate are addressed qualitatively using the latest studies and predictive models. These models predict

climate changes at a scale that is much larger (generally by multi-state regions of the US) than at an RMP planning area level. Therefore, there is incomplete information related to what climate changes may occur in specific areas of the Carson City District planning area. In the future, as tools for predicting climate changes in a management area improve and changes in climate affect resources and necessitate changes in how resources are managed, the BLM may be required to reevaluate decisions made as part of this planning process and to adjust management accordingly.

This RMP is also based on the concept of adaptive management, so it is dynamic enough to account for changes in resource conditions (such as changes due to climate change or large-scale wildfire), new information and science, and changes in regulation and policies. The RMP may be amended to respond to these factors. No incomplete or unavailable information was deemed essential to a reasoned choice among the alternatives portrayed in this EIS.

4.2 CUMULATIVE IMPACTS

The CEQ regulations implementing the NEPA define *cumulative impacts* as "...[T]he impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions." Cumulative impacts can result from minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). Guidance for implementing the NEPA requires that federal agencies identify the timeframe and geographic boundaries within which the potential cumulative effects of actions would be evaluated with specific past, present, and reasonably foreseeable actions.

The CEQ regulations explain "significance" as it relates to environmental analysis and requires consideration of both context and intensity of impacts. The degree of intensity or severity of impacts is included in the analysis of direct, indirect, and cumulative effects. CEQ regulations include the following considerations for evaluating intensity:

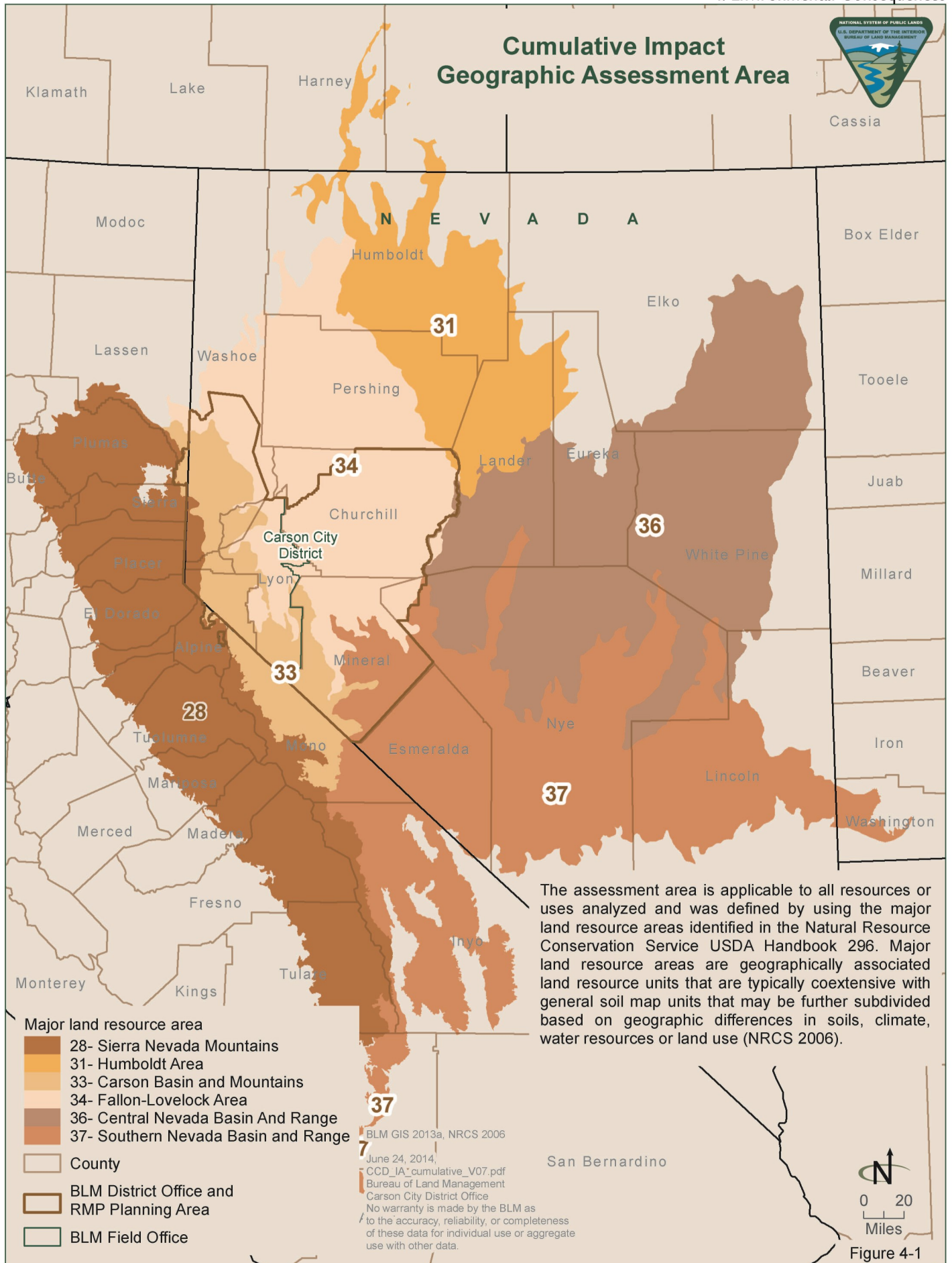
- Impacts that may be both beneficial and adverse. A significant effect may exist even if the federal agency believes that on balance the effect will be beneficial.
- The degree to which the proposed action affects public health or safety.
- Unique characteristics of the geographic area such as proximity to historic or cultural resources, prime farmlands, wetlands, wild and scenic rivers (WSRs), or ecologically critical areas.
- The degree to which the effects on the quality of the human environment are likely to be highly controversial.

- The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
- The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
- Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.
- The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the NRHP (or National Register), or may cause loss or destruction of significant scientific, cultural, or historical resources.
- The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the ESA.
- Whether the action threatens a violation of federal, state, or local law or requirements imposed for the protection of the environment.

4.2.1 Cumulative Analysis Methodology

The cumulative impact geographic assessment area for the CCD RMP/EIS is shown in **Figure 4-1**, Cumulative Impacts Assessment Area, and is applicable to all resources or uses analyzed. The assessment area was defined by using the major land resource areas identified in the US Department of Agriculture, Natural Resource Conservation Service Handbook 296. Major land resource areas are geographically associated land resource units that are typically coextensive with general soil map units that may be further subdivided based on geographic differences in soils, climate, water resources or land use (NRCS 2006). For the purposes of this analysis, past and present actions span from 1983 to present and correspond to when management framework plans and RMPs incorporated into the Consolidated RMP were initially implemented. The timeframe for reasonably foreseeable future actions extends to 2035 based on the expected life of this plan. Management actions could be influenced by activities and conditions on adjacent public and non-public lands beyond the planning area boundary; therefore, assessment data and information could span multiple scales, land ownerships, and jurisdictions. These assessments involve determinations that often are complex and, to some degree, subjective.

The cumulative impacts discussion that follows considers the alternatives in the context of the broader human environment—specifically, actions that occur outside the scope and geographic area covered by the RMP. Cumulative impact analysis is limited to important issues of national, regional, or local significance;



therefore, not all resources identified for the direct and indirect impact analysis in this EIS are analyzed for cumulative impacts.

Because of the programmatic nature of an RMP and cumulative assessment, the analysis tends to be broad and generalized to address potential effects that could occur from a reasonably foreseeable management scenario combined with other reasonably foreseeable activities or projects. Consequently, this assessment is primarily qualitative for most resources because of lack of detailed information that would result from project-level decisions and other activities or projects. Quantitative information is used whenever available and as appropriate to portray the magnitude of an impact. The analysis assesses the magnitude of cumulative impacts by comparing the environment in its baseline condition with the expected impacts of the alternatives and other actions in the same geographic area. The magnitude of an impact is determined through a comparison of anticipated conditions against the naturally occurring baseline as depicted in the affected environment (see **Chapter 3**) or the long-term sustainability of a resource or social system.

The following factors were considered in this cumulative impact assessment:

- Federal, nonfederal, and private actions
- Potential for synergistic interaction among or between effects
- Potential for effects across political and administrative boundaries
- Other spatial and temporal characteristics of each affected resource
- Comparative scale of cumulative impacts across alternatives

Temporal and spatial boundaries used in the cumulative analysis are developed on the basis of resources of concern and actions that might contribute to an impact. The baseline date for the cumulative impacts analysis is 2010. The temporal scope of this analysis is the life of the RMP, which encompasses a 20-year planning period.

Spatial boundaries vary and are larger for resources that are mobile or migrate (e.g., antelope populations) compared with stationary resources. Occasionally, spatial boundaries could be contained within the planning area boundaries or an area within the planning area. Spatial boundaries were developed to facilitate the analysis and are included under the appropriate resource section heading.

4.2.2 Past, Present, and Reasonably Foreseeable Future Actions

The following past, present, and reasonably foreseeable future actions have been identified based on review of the planning issues; agency records, including existing decisions and formal proposals; actions highly probable based on known trends; and review of non-federal actions on lands not administered by the BLM, including private land actions and other federal, local, tribal and state land actions:

- Climate Change
- Invasive, non-native species and noxious weeds treatments
- Lands and realty (land tenure adjustments, ROWs) and communication site authorizations)
 - Industrial, agricultural, commercial, and residential development on private lands
 - Infrastructure developments including power lines, pipelines, communication sites, recreation facilities, and renewable energy on private lands
- Livestock grazing
- Military training operations
- Minerals (exploration and development)
- Renewable energy (exploration and development)
- Recreation (SRPs and OHV travel management)
- Vegetation management
- Wildlife and special status species management
- Wild horse and burros management
- Wildland fire management (suppression, fuels management, emergency stabilization and rehabilitation [ESR])

Past, present, and reasonably foreseeable future actions are considered in the analysis to identify whether and to what extent the environment has been degraded or enhanced, whether ongoing activities are causing impacts, and trends for activities in and impacts on the area. Projects and activities are evaluated on the basis of proximity, connection to the same environmental systems, potential for subsequent impacts or activity, similar impacts, the likelihood a project will occur, and whether the project is reasonably foreseeable.

Effects of past actions and activities are manifested in the current condition of the resources, as described in the affected environment (see **Chapter 3**). Reasonably foreseeable future actions are actions that have been committed to or known proposals that could take place within the 20-year planning period.

Reasonably foreseeable future action scenarios are projections made to predict future impacts; they are not actual planning decisions or resource commitments. Projections, which have been developed for analytical purposes only, are based on current conditions and trends and represent a best professional estimate. Unforeseen changes in factors such as economics, demand, and federal, state, and local laws and policies could result in different outcomes than those projected in this analysis.

Other potential future actions have been considered and eliminated from further analysis because it is unlikely that these actions would be pursued and implemented within the life of the plan or because so little is known about the potential action that formulating an analysis of impacts is premature. In addition, potential future actions protective of the environment (such as new potential threatened or endangered species listings or regulations related to fugitive dust emissions) have less likelihood of creating major environmental consequences alone, or in combination with this planning effort. Federal actions such as species listing would require the BLM to reconsider decisions created from this plan because the consultations and relative impacts might no longer be appropriate. These potential future actions may have greater capacity to affect resource uses within the planning area; however, until more information is developed, no reasonable estimation of impacts could be developed.

Data on the precise locations and overall extent of resources within the planning area are considerable, although the information varies according to resource type and locale. Furthermore, understanding of the impacts on and the interplay among these resources is evolving. As knowledge improves, management measures (adaptive or otherwise) would be considered to reduce potential cumulative impacts in accordance with law, regulations, and the final RMP.

Projects and activities identified as having the greatest likelihood to generate potential cumulative impacts when added to the RMP alternatives are displayed in **Table 4-1**, Past, Present, and Reasonably Foreseeable Projects, Plans, or Actions that Comprise the Cumulative Impact Scenario. More detail on the cumulative impacts of implementing the RMP are described at the end of each analysis in **Sections 4.3** through **4.6**.

Table 4-1
Past, Present, and Reasonably Foreseeable Projects, Plans, or
Actions that Comprise the Cumulative Impact Scenario

<i>Human Actions</i>	
Energy and minerals development	There are currently 2 gold and silver operations, 1 copper operation, 1 magnesium compound operation, 1 salt mine, 4 diatomite operations, 1 gypsum operation, 2 perlite operations, 1 carbonate (limestone and lime) mineral operation, 1 pumice operation, and 1 pozzolan operation actively mining locatable minerals in the planning area. Approximately 23 plans of operation for exploration (greater than 5 acres) or mining of locatable minerals are currently administered by the BLM within the planning area. The minerals program administers 3 active competitive contracts for salable minerals operations removing more than 200,000 cubic yards annually, and more than 260 contracts or free-use permits for smaller volume salable minerals operations. There are 148 geothermal leases covering approximately 299,200 acres, with 5 associated power plants and an active geothermal power production of 183 megawatts (BLM 2013f).

Table 4-1
Past, Present, and Reasonably Foreseeable Projects, Plans, or
Actions that Comprise the Cumulative Impact Scenario

Energy and minerals development (continued)	<p>As discussed in the Geothermal Reasonably Foreseeable Development Appendix of the Carson City 2013 Mineral Potential Report, exploration drilling would occur on all 148 geothermal leases, some of which would lead to more detailed exploration drilling, and a few of which would lead to the discovery of geothermal resources capable of developing as many as 5 15-megawatt geothermal power plants (BLM 2013f). Exploration disturbance for each lease would be 4.5 acres. The analysis assumes 2 leases per year, which would result in 9 acres disturbed per year. The 15-megawatt power plant is used as a typical size to estimate the amount of disturbance that could be involved for reasonably foreseeable development. The total disturbance for 5 15-megawatt power plants would be 605 acres.</p> <p>Limited drilling and exploration for oil and gas resources have taken place in the planning area since the early 1900s in Washoe, Lyon, Churchill, and Mineral Counties. The CCD currently manages less than 30 oil and gas leases in Churchill, Nye, and Mineral Counties (BLM 2011). There is a limited amount of exploration on these leases, and no production has occurred in association with any of these leases. Oil exploration in the planning area has generally been limited to the Carson Desert north and west of Salt Wells Lake and the area surrounding Fallon. Oil discoveries in western Nevada have been limited to a few reported shows identified during drilling, usually in dry holes. The Nevada Bureau of Mines and Geology identified this area as favorable for oil and gas (Garside et al. 1988). Most of the area identified as favorable, including most of the Carson Sink, is not within the decision area. Therefore, there is no reason to believe that oil and gas production would be foreseeable within the planning area during the 20-year planning period.</p> <p><i>Battle Mountain Oil and Gas Leasing Environmental Assessments.</i> These documents provide for mineral development on the Battle Mountain District Office and are currently being revised in a new RMP planning effort.</p> <p><i>Winnemucca RMP (2013).</i> This RMP provides for mineral development on the Winnemucca District Office.</p> <p><i>Southern Nevada RMP (in progress) and Oil and Gas amendment.</i> This RMP will provide for mineral development on Southern Nevada District Office</p> <p><i>Winnemucca District Office Reasonably Foreseeable Development Scenario (BLM 2013e).</i> This document summarizes existing fluid minerals development activities and gives a future development scenario based on unconstrained development.</p> <p><i>Battle Mountain District Office Reasonably Foreseeable Development Scenario (2012).</i> This document summarizes existing fluid minerals development activities and gives a future development scenario based on unconstrained development.</p> <p><i>Winnemucca Mineral Potential Report (BLM 2006).</i> Looks at all minerals (non-oil and gas) and gives a 20-year prediction of development potential.</p> <p><i>Battle Mountain Mineral Potential Report (2012).</i> Looks at all minerals (non-oil and gas) and gives a 20-year prediction of development potential.</p>
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Table 4-1
Past, Present, and Reasonably Foreseeable Projects, Plans, or
Actions that Comprise the Cumulative Impact Scenario

Renewable Energy	<p>The CCD Reasonably Foreseeable Development Scenario for Solar, Wind and Biomass estimates that as many as 2 utility-scale PV solar plants, 2 utility-scale wind developments, and 2 small mobile biomass facilities would be permitted in the planning area in the next 20 years. National Renewable Energy Laboratory data shows that portions of the planning area have high potential for solar energy, especially Lyon and Mineral Counties (NREL 2013).</p> <p><i>Luning Solar.</i> Luning Solar was issued a ROW grant for a 575-acre project on July 15, 2010. A plan has been submitted for a 560-acre solar panel field.</p> <p><i>Salt Wells Geothermal Utilization Project by Gradient Resources for a 120-Megawatt Power Plant.</i> Construction has not been initiated.</p> <p><i>Carson Lake Geothermal Utilization Project by Ormat for a 40-Megawatt Power Plant.</i> Construction has not been initiated.</p> <p><i>New York Canyon Geothermal 62-Megawatt Power Plant.</i> NEPA analysis has been finalized, but construction has not been initiated.</p>
Vegetation Management	<p>Forestry. Past, current, and foreseeable forestry uses in the project area include personal and commercial harvest of pinyon and juniper fuel wood, poles and posts for fence building, wildings (live trees), pinyon pine nuts, and Christmas trees. Christmas tree sales have been on the decline, whereas firewood permits were on the increase; however, both uses are expected to continue at current rates. Personal collection of pinyon pine nuts is also expected to continue. The Consolidated RMP limited non-commercial harvest to less than 25 pounds per individual</p> <p>Firewood, posts, poles, and biomass are all low-value products. The felling (cutting down individual trees), processing, and transportation costs associated with these products limit the feasibility of large-scale utilization. As stated under Renewable Energy, 2 small mobile biomass facilities would be permitted in the planning area in the next 20 years.</p> <p>In absence of active management of the forest and woodlands in the planning area, the aforementioned trends of higher tree densities, expansion/ reforestation of pinyon-juniper, contraction of aspen and riparian deciduous stands, and drought/insect/disease-related mortality are expected to continue.</p> <p><i>Northeast California Juniper Treatments.</i> Multiple juniper removal treatments throughout the Alturas, Surprise and Eagle Lake Field Offices totaling 32,099 acres.</p> <p>Vegetation treatments. Mechanical, biological, and chemical treatments of undesirable vegetation were utilized in the past on public and private rangelands in the planning area. These treatments and maintenance of these vegetation treatments will likely continue on public and private lands. In addition, manual, biological, chemical and mechanical treatments of non-native and invasive species are likely to continue in the foreseeable future.</p> <p>There are large amounts of sagebrush habitat throughout the planning area that is experiencing active pinyon and juniper expansion. In addition, cheatgrass is present in sagebrush habitats district-wide, creating a potential for habitat conversion post-disturbance. Over 67,000 acres of the planning area is presently annual grassland, having already experienced type conversion from the previous native vegetative community. Pinyon and juniper are expected to continue expanding into sagebrush communities.</p>

Table 4-1
Past, Present, and Reasonably Foreseeable Projects, Plans, or
Actions that Comprise the Cumulative Impact Scenario

Riparian Systems	<p>Proper functioning condition assessments show that the majority of riparian areas are not in proper functioning condition. Many of the assessments indicate downward trends due to ongoing disturbances, mainly anthropogenic. Almost 70 percent of the land assessed was rated as not meeting Standard 2 (Riparian/Wetland systems are in proper functioning condition), and 25 percent of the land assessed did not meet Standard 3 (Water quality criteria in Nevada or California State Law shall be achieved or maintained).</p> <p>Riparian areas have and are expected to continue in a downward trend, with inadequate protection, and an increase in invasive species number, density and extent. In areas with headcuts, entrenchment and lowering of groundwater levels will continue unabated with xeric native species and nonnative species dominating the sites.</p>
Livestock grazing	<p>Within the planning area, there are 111 allotments and 52 permittees. Allotments include 77 available for livestock grazing and 34 unavailable for livestock grazing for a variety of reasons, including, but not limited to, grazing for wildlife, voluntary relinquishment, and issues with base property. The open allotments vary in size from 120 to 512,449 BLM-administered acres, with grazing allocations ranging from 29 to 11,410 AUMs in each allotment. In 2011, 82 percent of the permits were for cattle (55 permits), with sheep and horse grazing accounting for the remaining 18 percent (12 permits).</p> <p>Grazing on private lands within the cumulative impact analysis area is expected to remain stable or slightly decrease as residential development increases.</p> <p>Anticipated demand for livestock grazing on BLM-administered lands is expected to continue into the future. There is interest in acquiring grazing permits as they become available. In addition, due to the proximity to expanding urban areas, some grazing areas may lose available acreage. This loss ensures the demand for the areas that will remain available for livestock grazing.</p>
Recreation and visitor use	<p>Demands for undeveloped, dispersed recreation on BLM-administered lands have been increasing over the last decade, especially for motorized all-terrain vehicle (ATV) use. However, dispersed use of BLM-administered lands has also been affected by the economic downturn. As the economy recovers, disposable incomes go up and the demand for recreational opportunities is expected to rise.</p> <p>Population increases in urban interface areas will also increase the demand for access to BLM-administered lands from or near residential developments and the need to provide increased management and protection of resources.</p>
Wildlife and Special Status Species Habitat Management	<p>Habitat for wildlife and special status species continues to be affected by wildfire, land uses, and conversion of habitat to areas dominated by non-native, invasive plant species. Managing to protect and rehabilitate wildlife and sensitive species habitat will continue.</p>

Table 4-1
Past, Present, and Reasonably Foreseeable Projects, Plans, or
Actions that Comprise the Cumulative Impact Scenario

Lands and Realty	<p>The urban areas of Reno/Sparks, Carson City, and Gardnerville/Minden experienced annual growth rates as high as 8 percent between 2000 and 2007. The growth rates of these urban areas have plateaued since 2007, and in some cases, populations have declined. Despite recent trends, the demands on BLM-administered lands, particularly in the urban interface, remain high. Community-level demands on BLM-administered lands include locations for future commercial and residential development, flood protection, and parks and open space. Some of the demands have been met through the sale of BLM-administered land with identified commercial or residential development potential, acquisition of environmentally sensitive lands, and leasing or conveying of lands under the Recreation and Public Purposes Act of 1926 for schools, parks, and other public purposes.</p> <p>Military training operations (e.g., helicopter and other aviation training, land navigation, search and rescue, and driver training) have been and will continue to be conducted on the BLM-administered lands in the planning area. Ground mobility training has been on the increase with visiting military teams that desire a desert environment for training in addition to the local teams. This use is expected to continue and possibly occur more frequently with the use of BLM-administered lands expected to continue to increase.</p> <p>The CCD has disposed of approximately 4,954 acres since January 1, 2001. The disposals were made up of 10 Recreation and Public Purposes Act patents (623 acres); 2 Desert Land Entries (380 acres), 7 land exchanges (2,420 acres), special legislation (728 acres), and 6 sales (803 acres). During that same timeframe, the BLM acquired approximately 34,254 acres. The acquisitions were composed of 6 land exchanges (30,968 acres); 17 FLPMA (FLPMA; funded by Southern Nevada Public Land Management Act and Land and Water Conservation Fund) acquisitions (2,916 acres); 1 donation (30 acres); and 1 transfer from another agency (340 acres). The BLM has also acquired 1,873 acres of conservation easement.</p> <p>An increase in demand for land tenure adjustments is anticipated. In addition to continuing interest in availability of BLM-administered lands for public and private enterprises, a number of proposals for federal legislation to transfer BLM-administered lands to local governments, tribes, or other entities are currently under consideration.</p> <p>Areas with anticipated higher potential for land tenure adjustments include inholdings or lands next to specially designated areas such as ACECs, Special Management Areas, WSAs, and existing or potential recreation sites. In addition, BLM-administered lands interfacing with areas of increasing population growth, landlocked parcels, and parcels that are difficult or uneconomic to manage may be targeted for potential land tenure adjustments.</p> <p>Demand for land use authorizations in the planning area is anticipated to increase in correlation with future residential and commercial development on adjacent private lands and in response to increasing population and energy demands within and beyond the CCD. Over the past 10 years, the BLM has averaged issuance of approximately 28 ROW authorizations per year with an average of 35 applied for annually. Issuance of permits varies depending on demand, but typically average between 1 and 3 per year. Communication facility lease applications, on both existing and new sites, are expected to continue to increase on BLM-administered lands within the planning area.</p>
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Table 4-1
Past, Present, and Reasonably Foreseeable Projects, Plans, or
Actions that Comprise the Cumulative Impact Scenario

Lands and Realty (continued)	Designation of Energy Corridors on Federal Lands in the 11 Western States Programmatic EIS (2007). This multi-federal agency Programmatic EIS analyzes the environmental impacts of designating federal energy corridors on federal lands in 11 western states and incorporating those designations into relevant land use and resource management plans.
Wild Horse and Burro	<p>Since the passage of the Wild Free-Roaming Horses and Burros Act, the BLM continues to manage wild horse and burro populations and habitat. Past and present actions to maintain appropriate management levels (AMLs) primarily through wild horse and burro gathers have occurred and are anticipated to continue in the future. However, due to various constraints, wild horse and burro gathers are not conducted as frequently as needed to maintain a thriving natural ecological balance among wild horse and burro populations, domestic livestock, wildlife, and vegetation. This trend is expected to continue and has become exacerbated by the current drought.</p> <p>As the wild horse and burro populations exceed the AMLs, a thriving natural ecological balance among wild horse and burro populations, domestic livestock, wildlife, and vegetation will not be maintained</p>
Natural Processes	
Invasive/non-native species and noxious weeds	<p>Noxious weeds and non-native species have invaded and will continue to invade many locations in the planning area. Noxious weeds are carried by wind, humans, machinery, and animals. The BLM currently manages weed infestations through integrated weed management, including biological, chemical, mechanical, and educational methods. The 1991 and 2007 Records of Decision for Vegetation Treatment on BLM Lands in Thirteen Western States, and the 2007 Programmatic Environmental Report guide the management of noxious weeds in western states.</p> <p>Noxious and invasive weeds are expected to continue to spread on all lands. Due to their ability to tolerate certain conditions, some species are expected to remain a serious long-term challenge in the planning area.</p> <p>Without an in plant management approach, damaged or degraded areas are not revegetated allowing noxious weeds to persist and increase on the landscape and overtime will allow the succession of other non-native invasive species to migrate to the area, establish and gain dominance.</p>
Wildland Fire Management	<p>Based on fire occurrence data collected from 1980 to 2013 on average less than one percent of the CCD is affected by wildfire each year.</p> <p>The wildland-urban interface (WUI) has been increasing dramatically throughout the planning area over the past two decades. Development slowed during the economic downturn beginning in 2008, but WUI expansion is expected to increase over the life of the RMP. In addition to residential, commercial, and industrial development next to BLM-administered lands, the WUI also includes power lines, pipelines, communication sites, recreation facilities, renewable energy, and military training areas. Many of the intensive and costly fire suppression actions occur within and next to the expanding WUI, and this trend is expected to continue.</p> <p>Trends indicate that the number of wildfires would continue to gradually increase based on climate, conversion of habitat to areas dominated by non-native, invasive species, and increased potential for human caused fires due to population growth and increases in recreation use.</p>

Table 4-1
Past, Present, and Reasonably Foreseeable Projects, Plans, or
Actions that Comprise the Cumulative Impact Scenario

Wildland Fire Management (continued)	ESR of areas that have burned from wildfire would continue based on the number of acres burned by wildfires. ESR treatments would continue be prioritized to provide for human life and safety, soil/water stabilization, restoration of important habitat for special status species, and to deter establishment of invasive plants. Areas previously seeded post fire would re-establish vegetation and deter the establishment and spread of non-native, invasive species. Continued integrated weed management would also deter the establishment and spread of non-native, invasive species and noxious weeds.
Climate Change and Drought	<p>Nevada's gross greenhouse gas emissions in 2010 were 45 million metric tons of carbon dioxide equivalents, or 0.7 percent of gross US greenhouse gas emissions (6,875 million metric tons) in that same year (NDEP 2012a). Nevada's gross greenhouse gas emissions rose faster than those of the nation as a whole, increasing 30 percent from 1990 to 2010 (NDEP 2012a), while national emissions rose by only 10 percent during this period (EPA 2014a). Rapid population growth has been the most important driver in emissions growth in Nevada. Much of this population growth has taken place near Las Vegas, which also adds to emissions in the state through air travel. The majority of the growth in greenhouse gas emissions came from transportation and electricity generation (EPA 2012a).</p> <p>According to the US Drought Monitor, as of May 28, 2013, approximately 64 percent of the State of Nevada is experiencing severe drought conditions (US Drought Monitor 2013). Field monitoring indicates that many areas within the Carson City District (CCD) are experiencing drought impacts including substantial reductions in forage production and reduced spring and stream flows. It is likely that a continuation of these conditions would impair forage and water resources on many more areas within the planning area.</p> <p>As of February 27, 2013, the US Department of Agriculture designated Douglas County and Carson City as well as other counties in Nevada, as primary natural disaster areas due to damages and losses caused by the recent drought. Douglas County and Carson City are located within the planning area. Additionally, farmers and ranchers in Lyon, Nye, and Washoe Counties qualified for natural disaster assistance.</p> <p>In June 2013, the CCD published the Finding of No Significant Impact and Final Carson City District Drought Management Environmental Assessment (US Drought Monitor 2013). The EA provides numerous drought response actions that allow for the BLM to provide a rapid response to drought situations on BLM-administered lands in order to alleviate the impacts of authorized uses and activities on natural resources that are at risk of being adversely affected by drought conditions.</p>

4.3 RESOURCES

4.3.1 Air

Summary

The primary sources of air pollutant emissions on BLM-administered lands in the planning area include exhaust emissions from vehicles, motorized recreational equipment, and maintenance equipment; wildland fires and

prescribed burns; vehicle and motorized recreational equipment travel on unpaved roads; wind erosion; mining and mineral developments; and energy resource developments. Wildland fires have the greatest and most widespread effects on air quality and can impact regional air quality conditions, including more urban areas depending on location and wind conditions. Other emission sources tend to have more localized effects on air quality.

Air quality management objectives for all of the RMP alternatives include maintaining compliance with federal and state air quality standards and air quality management programs and carrying out the FLPMA's instruction to protect air and atmospheric values while managing BLM-administered lands according to the principles of multiple use and sustained yield. Owners and operators of mineral and energy resource development projects would continue to be subject to state and federal air quality management programs, including air permit programs and fugitive dust control programs. Both existing and future gold and silver mining operations would be subject to Nevada and Environmental Protection Agency (EPA) mercury regulations.

Most of the CCD is in attainment of National Ambient Air Quality Standards (NAAQS) for all federally regulated pollutants, though a portion of Washoe County is a serious nonattainment area for particulate matter less than 10 micrometers in diameter (PM₁₀). The primary sources of PM₁₀ emissions within the nonattainment area are fugitive dust from travel on paved and unpaved roads (68 percent of emissions in 2011), wildfires (22 percent of emissions), and residential wood combustion (6 percent of emissions; Washoe County AQMD 2012). The EPA exceptional events policy excludes air quality impacts associated with natural events from consideration when determining whether or not an area complies with federal ambient air quality standards. Wildfires may result in violations of ambient air quality standards at monitoring stations in the planning area, but Nevada may request that the EPA exclude these violations as exceptional events.

Future mining activities, geothermal developments, and renewable resource developments would be similar under all RMP alternatives; therefore, impacts on air quality would be similar under all alternatives. RMP alternatives would differ somewhat in the location and amount of recreational activity, especially OHV use. However, overall levels of recreational usage would be similar under most alternatives and may increase with increasing population. Only Alternative C places restrictions on this usage that may result in a decrease in the level of use and associated emissions.

Methods of Analysis

Methods and Assumptions

A qualitative approach was used for analyzing impacts on air quality based on an understanding of the current air quality conditions within the planning area.

Current air quality conditions are described in detail in **Section 3.2.1, Air Quality**. This approach involved identifying the pollutants associated with a proposed planning element, describing the relative magnitude of emissions changes, and indicating the extent of potential impacts. The primary air quality measures affected by activities on BLM-administered lands are PM₁₀ and PM_{2.5}. While significant across the landscape, other criteria pollutants are unlikely to be substantially changed by actions on BLM-administered lands. Impacts on air quality are assessed for the different alternatives to analyze whether the overall air quality goal of maintaining existing air quality and air quality related values would be met under each alternative.

The analysis includes the following assumptions:

- Weather-related events and wildland fires may cause or contribute to local or regional air resource impacts.
- The area's population will continue to increase, as will demands on BLM-administered lands.

Indicators

Indicators used in the air quality analysis include the following:

- Changes in prescribed burns, wildland fire, and wildland fire management
- Acres of unpaved roads in the analysis area and use designations
- Level of mining
- Level of energy development
- Level of livestock grazing
- Amount of road construction and maintenance

Nature and Type of Effects

Air quality is affected by actions that introduce pollutants into the atmosphere. The degree of impact depends upon the amount of pollutants emitted, the existing air quality of a region, and localized conditions such as temperature, wind speed and direction, precipitation, and topography. The primary sources of emissions on BLM-administered lands are combustion sources such as vehicles (including OHVs), construction equipment, and maintenance equipment; fugitive dust from surface disturbance and wind erosion; and fire.

Actions that reduce emissions of air pollutants can improve air quality and air quality-related values. Actions that increase emissions of air pollutants can have negative effects on air quality and air quality-related values. An increase in sulfur dioxide, nitrogen oxide, PM₁₀, and PM_{2.5} emissions can result in decreased visibility, increased atmospheric nitrogen and sulfur deposition on soils and vegetation, and acidification of sensitive water bodies. Fugitive dust could

potentially result in increases in ambient concentrations of PM₁₀ and PM_{2.5}, resulting in localized impacts on vegetation and increases in atmospheric deposition. Particulate matter also contributes to haze and limits visibility. Ozone, which is formed by a chemical reaction between volatile organic compounds and nitrogen oxides, contributes to smog, which limits visibility.

Particulate matter emissions (fugitive dust) are primarily caused by ground-disturbing activities and vehicular traffic on unpaved roads and surfaces associated with development and operation and with recreation (primarily OHV use). Concentrated livestock grazing can also disturb soils and break apart biotic soil crusts making soils susceptible to windblown dust.

Fires, particularly uncontrolled fires, can emit large quantities of particulate matter into the atmosphere, affecting visibility as well as human health. The degree and extent of the impact depends upon the severity of the fire as well as the meteorological conditions at the time. Large fires can result in exceedances of NAAQS at nearby or downwind monitoring stations; however, the state can request that EPA exclude these violations as exceptional circumstances. Burned areas also are susceptible to wind erosion until the burned areas are revegetated and the exposed soils are stabilized.

Fires also emit large quantities of carbon monoxide, nitrogen oxides, sulfur oxides, and organic compounds. Prescribed fires and wildfires that occur on BLM-administered lands in the planning area could contribute to elevated levels of particulates in those areas and impact visibility. In the long term, controlling fuel load through prescribed burns and vegetation treatments can reduce the risk of uncontrolled wildfire and resultant effects on air resources (Wiedinmyer and Hurteau 2010).

Management for the following resources would not result in an effect on air quality: caves and cave resources, climate change, fish and wildlife, special status species, paleontological resources, visual resources, forestry and woodland products, lands and realty, ACECs, national trails, WSAs, WSRs, back country wildlife conservation areas, tribal interests, public health and safety, and interpretation and education.

Air Quality: Effects from Air Quality Management

Effects Common to All Alternatives

RMP air quality management objectives and actions under all alternatives include maintaining compliance with state and federal requirements and programs. This includes Nevada Bureau of Air Quality Planning rules, which prohibit the use, maintenance, or construction of roadways without taking appropriate dust abatement measures (Nevada Administrative Code 445B.22037); the Smoke Management Memorandum of Agreement, which requires reporting size, date of burn, fuel type, and estimated air emissions for each prescribed burn (USDA, US DOI, and State of Nevada 2010); and Nevada and California prescribed burn

permitting requirements. The programs noted here focus on the pollutants of greatest concern in the planning area, PM_{10} and $PM_{2.5}$, and their primary sources on BLM-administered lands within the planning area, prescribed fire, and fugitive dust. While carbon monoxide is also a pollutant of concern in a small portion of the planning area (the Reno and Sparks areas of Washoe County), there is very little BLM-administered land in this area. The primary sources of carbon monoxide in Washoe County are mobile and nonmobile source, residential wood burning, and wildfires and prescribed burning. The primary sources on BLM-administered land that could affect the carbon monoxide maintenance area are prescribed burns and on- and off-road vehicles.

State and federal regulatory programs related to these emission sources are designed to minimize the resulting air pollutant concentrations downwind of the emission sources. The BLM would continue to comply with Nevada permit program requirements for prescribed burns. Any prescribed burn expected to emit more than one ton of PM_{10} would require an open burn permit from the Nevada Bureau of Air Pollution Control. Prescribed burns expected to emit more than 10 tons of PM_{10} would require a more detailed permit application. In addition, a burn plan is required for prescribed burns expected to emit more than 10 tons of PM_{10} . There are no air permit requirements for wildland fire suppression activities. Programs allowing conditional fire suppression management for a benefit require an annual permit application that identifies areas being considered for prescribed fires or for allowing conditional fire suppression management for a benefit. The permit application must identify the conditions under which naturally ignited wildfires may be allowed to burn rather than being suppressed. BLM road construction and road maintenance activities that would disturb more than 20 acres would be subject to Nevada surface area disturbance permit requirements and would require preparation of a fugitive dust control plan.

Effects under Alternative A

Under Alternative A, the BLM would maintain air quality standards through case-by-case review of activities on BLM-administered lands and continuation of existing planning actions outlined in **Table 2-2**. These actions include applying stipulations or measures to reduce negative air quality impacts, limiting activities so as not to exceed a 50 percent reduction in ground cover in high erosion areas, and limiting OHV use to designated roads and trails in areas of severe erosion hazard. Implementing these actions would continue to minimize particulate emissions by limiting activities or authorized uses in areas most susceptible to erosion hazards.

Effects under Alternatives B, C, D, and E

Air quality management under Alternatives B through E would implement BMPs and mitigation measures on a case-by-case basis to minimize adverse impacts on air quality from BLM and BLM-authorized activities. No air quality management actions are proposed for areas with high erosion potential. However, new

management actions are proposed under soil and water resources for each alternative to reduce erosion potential. This would continue to protect areas most susceptible to erosion and reduce fugitive dust emissions from wind or physical disturbance.

Air Quality: Effects from Soil Resources

Effects Common to All Alternatives

Exposed and sparsely vegetated soils are susceptible to wind erosion and are thus a source of fugitive dust emissions. Soil disturbance may be caused by a number of activities on BLM-administered lands, including mineral and energy development, livestock grazing, wild horse and burro use, travel on unpaved roadways, and OHV use. Air quality impacts associated with specific resource uses are discussed under each specific resource use category within this section. All alternatives include management actions to minimize soil erosion and maintain soil stability in areas of sensitive soils. Effects from soil resources management actions for each alternative are discussed below.

Effects under Alternative A

Alternative A would reduce soil erosion by limiting reduction in ground cover from activities in high erosion areas to 50 percent and by limiting OHV use to designated roads and trails in areas of severe erosion hazard. Implementing these actions would continue to minimize particulate emissions by limiting activities or authorized uses in areas susceptible to erosion hazards.

Effects under Alternative B

In addition to applying BMPs and mitigation measures to minimize soil erosion and maintain soil stability in areas of sensitive soils, Alternative B would maintain and improve vegetation cover in areas of high erosion potential by applying soil amendments or requiring a growth medium. Alternative B would also require an erosion control plan for disturbance on slopes greater than 30 percent. Measures to reduce soil erosion would also reduce fugitive dust emissions; impacts would be similar to those from measures under Alternative A.

Effects under Alternatives C, D, and E

Vegetation management and avoidance of soil disturbance on steep slopes in Alternatives C through E would have the greatest potential to control soil-related fugitive dust emissions. In addition to applying BMPs and mitigation measures to minimize soil erosion and maintain soil stability in areas of sensitive soils, these alternatives would improve and increase litter, biotic soil crusts, and vegetation cover and would implement stricter reclamation requirements for surface-disturbing actions. These alternatives would require an erosion control plan for disturbance on slopes between 21 and 39 percent, and would prohibit surface disturbance on slopes greater than 40 percent. Soils management actions under these alternatives would result in less soil erosion and fewer fugitive dust emissions compared to current management.

Air Quality: Effects from Water Resources*Effects under Alternative A*

No air quality impacts from water resource management were identified under Alternative A.

Effects under Alternatives B, C, D, and E

Water resources actions would result in short-term air quality impacts during construction of well importation or exportation projects, wells, or other water sources. Use of fuel burning equipment emits criteria air pollutants from equipment exhaust, while ground disturbance creates fugitive dust. No long-term air quality impact would result from water resources management.

Air Quality: Effects from Vegetation Resources*Effects under Alternative A*

Vegetation management under Alternative A focuses on meeting rangeland health standards and enhancing rangeland health for all rangeland values, including livestock, wildlife, and wild horses. Alternative A includes fewer vegetation management actions and may be less effective at improving vegetation health and thus long-term reductions in wildland fire potential and associated fire-related air quality impacts.

Effects under Alternative B

Alternative B would allow for the greatest amount of fire treatments for managing forest and woodlands. Under Alternative B, as many as 20,000 acres of low-density pinyon-juniper woodland would be converted to sagebrush-dominated communities per year and as many as 6,500 acres of medium- and high-density pinyon-juniper woodlands would be thinned per year.

Vegetation treatments using mechanical means release criteria air pollutants from equipment usage. Prescribed fire treatments emit ozone precursor emissions (nitrogen oxides and volatile organic compounds) that can result in locally high ozone concentrations. Fire treatments also emit particulates, which could affect public health and reduce visibility. The BLM would comply with state permit requirements for prescribed burns to ensure that fire treatments avoid air quality impacts on downwind locations and do not result in violations of NAAQS. Over the long term, management actions that reduce fuel load and improve woodland health would reduce the potential for wildland fires and associated air quality impacts.

Restoration and rehabilitation actions that would stabilize soils and prevent cheatgrass and invasive species from dominating burned areas and altering the natural fire regime would decrease the potential for wind erosion of soils and reduce the potential for reoccurrence of severe wildland fire, resulting in a long-term benefit for air quality.

Alternative B would use mechanical, biological, and chemical means to eradicate or control invasive species. These methods would result in minor short-term air quality impacts through the release of criteria pollutants from equipment or potentially small amounts of volatile organic compounds from herbicide use. Controlling invasive species would result in a long-term benefit because the establishment of noninvasive plants would reduce the occurrence of wildland fire and associated air quality impacts.

Effects under Alternative C

Impacts from forest and woodlands treatments would be similar to those described under Alternative B but would occur on a reduced scale. Under Alternative C, as many as 3,500 acres of low-density pinyon-juniper woodland would be removed per year and as many as 1,500 acres of medium- and high-density pinyon-juniper woodlands would be thinned per year. The use of fire treatments would be much less under this alternative. Alternative C would also manage for fuel hazard reduction, which could reduce fuel load and the resultant air quality impacts that occur with wildland fire.

Rehabilitation of burned areas by re-establishing appropriate species, subspecies, and understory plants relative to site potential would reduce the potential for establishment and spread of invasive plants and would contribute towards altering the fire reoccurrence interval from higher fire regime condition classes to lower condition classes. Restoration actions that prioritize the use of native plants would reduce potential for wind erosion of soils, resulting in a long-term benefit for air quality.

Alternative C would use mechanical and biological chemical means to eradicate or control invasive species. Controlling invasive species would result in a long-term benefit because the establishment of noninvasive plants would reduce the occurrence of wildland fire and associated air quality impacts.

Effects under Alternative D

Alternative D would engage interested parties to develop a comprehensive restoration strategy prior to further treatment of pinyon-juniper woodlands; therefore, the types of treatments under this alternative are not known at this time. Future strategies would undergo environmental review at the time they are proposed. Alternative D would also manage for fuel hazard reduction with a focus on areas around communities. Reducing fuel loads and the chance of fire next to communities would reduce the chance of wildfire and its associated health impacts.

Restoration and rehabilitation under Alternative D would focus on reducing fire potential within the urban interface by using fire resistant species and prioritizing the use of native plants. Decreasing the potential for reoccurrence of severe wildland fire in the urban interface and near sensitive human receptors would result in a long-term benefit on air quality.

Alternative D would use mechanical, biological, and chemical means to eradicate or control invasive species. Impacts would be similar to those described for Alternative B.

Effects under Alternative E

Impacts from forest and woodlands treatments would be similar to those described under Alternative B but would occur on a reduced scale. Under Alternative E, as many as 8,500 acres of low-density pinyon-juniper woodland would be removed per year and as many as 6,500 acres of medium- and high-density pinyon-juniper woodlands would be thinned per year. Alternative E would also manage for fuel hazard reduction, which could reduce fuel load and the resultant air quality impacts that occur with wildland fire.

Impacts from habilitation and restoration would be similar to those described for Alternative D.

Alternative E would use mechanical, biological, and chemical means to eradicate or control invasive species. Impacts would be similar to those described for Alternative B.

Air Quality: Effects from Wild Horse and Burro Management

Effects Common to All Alternatives

Management actions for wild horses and burros would result in negligible impacts on air quality under all alternatives. Gather and removal actions would be a temporary source of emissions from vehicle use, travel on unpaved roadways, and soil disturbance at gather sites and holding facilities. Wild horse and burro use of the land may result in minor levels of wind erosion and associated dust emissions through soil disturbance.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Air Quality: Effects from Wildland Fire Ecology and Management*Effects Common to All Alternatives*

Air quality impacts from wildland fire and fuels treatments, including prescribed burns, are discussed under *Nature and Types of Impacts*. It is difficult to accurately predict the number and extent of wildland fires that would occur over the life of this RMP. However, trends in wildland fires in the planning area over the last 30 years show that the acres burned in the planning area as a whole have decreased slightly in the decades between 1980 and 2013, while the percentage of those acres on BLM-administered lands has increased slightly in the same period. On average, less than 1 percent of the CCD is affected by wildland fire each year. While management actions under the different alternatives may affect the size, frequency, and location of future wildland fires, wildland fire trends of the last 30 years would likely continue over the life of this RMP. While past trends do not show an increase in acres burned over the long term, air quality has been and would continue to be affected in high-fire occurrence years as a result of conditions such as drought.

Effects under Alternative A

Alternative A includes fuels treatments to reduce fire hazard fuels as well as fire suppression in the event of a wildland fire. Air quality impacts from wildland fires and prescribed burns would be the same as described under *Nature and Types of Impacts*. In addition, vehicles and other equipment used in fuels treatment activities; vehicles, construction equipment (such as to create fire breaks), and aircraft used in fire suppression activities; and vehicles and construction equipment used in post-fire land stabilization activities would emit small amounts of criteria pollutant emissions during operation of this equipment.

Wildland fire would affect visibility during the time the fire burned, as described under *Nature and Types of Impacts*. Prescribed burns would also affect visibility but would be subject to the regulations and permit conditions described under *Effects from Air Quality Management*. To minimize the effect of controlled burns on air quality, these regulations and conditions limit the time of year and meteorological conditions under which prescribed burns can be conducted.

Effects under Alternative B

Impacts under Alternative B would be similar to Alternative A. The incidence of fire would be expected to follow existing trends.

Effects under Alternative C

Impacts under Alternative C would be similar to Alternative A. Chemical agents and dozers would not be used under this alternative in fire suppression actions, slightly reducing impacts on air quality compared to fire suppression options under Alternative A.

Alternative C would focus wildfire prevention efforts on areas of sensitive biological, cultural, and other natural resources. This focus could lead to fewer

wildfires in the less developed areas of the CCD but not on more urban areas. Overall, the incidence of fire would be expected to follow existing trends.

Effects under Alternative D

Impacts under Alternative D would be similar to Alternative A. Alternative D would focus on protecting the WUI from wildfire. The focus on these areas could reduce the incidence on fire in areas where air quality impacts on human health are the greatest. Overall, the incidence of fire would be expected to follow existing trends.

Effects under Alternative E

Impacts under Alternative E would be similar to Alternative A. Alternative E would utilize all fuels treatments methods to create fire safe communities and modify vegetation communities to achieve condition class, fuels, habitat, watershed, and riparian objectives. This focus on both urban and rural areas may lead to fewer wildfires over the long term, though the incidence of fire is expected to follow existing trends over the life of the RMP.

Air Quality: Effects from Cultural Resources Management

Effects Common to All Alternatives

Cultural resource management actions would result in negligible impacts on air quality. Excluding areas from surface-disturbing activities and reducing use on or decommissioning existing roads to protect sensitive cultural resources may reduce fugitive dust associated with surface disturbance. These exclusions are described under each alternative.

Effects under Alternative A

Management of cultural resources Alternative A would not impact air quality.

Effects under Alternative B

Under Alternative B, the BLM would manage a 0.25-mile ROW avoidance area on either side of the centerline of historic roads and trails eligible for the NRHP but are not congressionally designated.

Effects under Alternative C

Under Alternative C, the BLM would manage a 2.5-mile ROW avoidance area on either side of the centerline of historic roads and trails eligible for the NRHP but are not congressionally designated.

Effects under Alternative D

Impacts under Alternative D would be the same as for Alternative B.

Effects under Alternative E

Under Alternative E, the BLM would manage a 1-mile ROW avoidance area on either side of the centerline of historic roads and trails eligible for the NRHP but not congressionally designated.

Air Quality: Effects from Livestock Grazing Management*Effects Common to All Alternatives*

Livestock grazing is a source of fugitive dust emissions from soil disturbance and reduced vegetation and biotic soil crust density that results in wind erosion. Livestock grazing operations, including the transport of livestock, would be a temporary source of fugitive dust and vehicle emissions.

Effects under Alternatives A, B, D, and E

Alternatives A, B, D, and E would manage a similar number of acres as available or not available to livestock grazing. Impacts would be as described under *Effects Common to All Alternatives*.

Effects under Alternative C

Alternative C would reduce the number of acres available to grazing by approximately 56 percent and would reduce AUMs to no more than 27 percent of existing levels, resulting in fewer emissions related to livestock grazing on BLM-administered lands within the planning area.

Air Quality: Effects from Geology and Mineral Management*Effects Common to All Alternatives*

Mining and mineral extraction activities in the planning area would impact air quality in the immediate vicinity of related surface-disturbing activities. Such impacts include particulates generated from blasting, excavation, loading, and hauling activities. Construction equipment operations also would be a source of engine exhaust emissions. For mining operations other than casual/recreational mining, plans of operation must be submitted by the claimant and reviewed by the BLM. Integral to these plans are requirements that all applicable federal, state, and local regulation for air pollution control are met, including obtaining air quality permits and implementing fugitive dust control plans. Most mining operations and energy developments would be subject to stationary source permit requirements. Nevada dust control program regulations would apply to mineral or energy developments that disturb more than 20 acres. In addition, Nevada regulations on mercury emissions (Regulation R189-05), which became effective in May 2006, apply to owners and operators of both existing and new gold or silver mining facilities, according to schedules established in the Nevada regulations, and the EPA's final rule on Mercury standards published on May 3, 2011 (40 CFR Part 63).

Oil and gas potential is low within the planning area; therefore, air quality impacts from development and operation of oil and gas wells and associated infrastructure would not be anticipated.

The planning area is an active geothermal resource area. Sources of air quality emissions associated with geothermal development include construction equipment and vehicle exhaust, fugitive dust during access road, well pad,

pipeline, and power plant construction, and emissions associated with well drilling, which include both criteria pollutant emissions as well as non-condensable gases such as carbon dioxide, hydrogen sulfide, methane, and ammonia, as well as trace amounts of mercury and arsenic when these compounds are contained in the geothermal resource. Depending upon the type of facility constructed, cooling towers, cooling ponds, and reinjection wells are also sources of emissions.

Emissions associated with operation of geothermal power plants depend on the type of plant constructed. Binary heat transfer systems are closed loop systems and have no significant air pollutant emissions. Flash steam systems are not closed systems and emit steam and minerals contained in geothermal fluids to the atmosphere. Hydrogen sulfide and particulate matter from minerals contained in geothermal fluids are the air pollutants emitted of most concern, though small quantities of other gases such as methane, benzene, sulfates, ammonia, boron, mercury, selenium, arsenic, and some metals may also be emitted depending on the characteristics of the geothermal resource. Emissions from geothermal facilities require air quality operating permits from the Nevada Bureau of Air Pollution Control.

Effects under Alternative A

Impacts under Alternative A would be the same as discussed under *Effects Common to All Alternatives*.

Effects under Alternative B

Impacts under Alternative B would be the same as discussed under *Effects Common to All Alternatives*. Alternative B would manage a similar number of acres as open to fluid mineral leasing but would manage more acres as subject to no surface occupancy (NSO) or controlled surface use (CSU) stipulations than Alternative A. Alternative B would also manage more acres as closed to nonenergy leasable mineral exploration or development, 439,600 acres as petitioned for withdrawal from locatable mineral entry, and 807,200 acres as closed to mineral material entry. Management actions that place restrictions on mineral extraction and exploration activities would reduce the negative impacts of mineral development on air quality. Closing additional areas to mineral development and limiting surface-disturbing actions in areas open to fluid mineral leasing could lower emissions associated with exploration and development of minerals.

Effects under Alternative C

Impacts under Alternative C would be the same as discussed under *Effects Common to All Alternatives*. Alternative C would manage fewer acres open to fluid mineral leasing and more acres as subject to NSO or CSU stipulations than Alternative A. Alternative C would also manage 2,960,800 acres as closed to nonenergy leasable mineral exploration or development, 117,500 acres as petitioned for withdrawal from locatable mineral entry, and 3,004,800 acres as

closed to mineral material entry. Alternative C would close the most acreage and place the highest level of restrictions on actions that would emit air pollutants resulting in the lowest emissions related to mineral development compared to the other alternatives.

Effects under Alternative D

Impacts under Alternative D would be the same as discussed under *Effects Common to All Alternatives*. The acreages managed as open or closed to mineral development would be similar to those described under Alternative B, except Alternative D would petition fewer acres for mineral withdrawal.

Effects under Alternative E

Impacts under Alternative E would be the same as discussed under *Effects Common to All Alternatives*. Alternative E would manage more acres as closed to fluid mineral leasing than Alternative A. Alternative E would also manage over twice as many acres as closed to nonenergy leasable mineral exploration or development and over three times as many acres closed to mineral material entry as Alternative A. In addition, Alternative E would manage 470,600 acres as petitioned from locatable mineral entry.

Alternative E closes the second most acres and places the highest level of restrictions on actions that would emit air pollutants, resulting in the lowest emissions related to mineral development compared to the other alternatives. Management actions under Alternative E would result in fewer emissions associated with exploration and development of minerals than under Alternative A.

Air Quality: Effects from Recreation and Visitor Services

Effects Common to All Alternatives

On-road and off-road motorized vehicle use (e.g., OHVs, all-terrain vehicles [ATVs], and motorcycles) is the largest source of air pollutant emissions associated with visitor activities. These activities generate exhaust emissions and particulate emissions from travel on unpaved roads and trails. Based on annual visitor use days, OHV travel is the most popular recreational activity in the planning area. Motorboats, motocross, pleasure driving, campfires, and camp stoves are additional sources of criteria pollutants emissions associated with recreational visitor activities. Visitor use levels for recreation-related activities are expected to rise with increasing populations in the planning area. Air emissions related to these activities, primarily vehicle travel to recreation areas, would likely increase.

Effects under Alternative A

Under Alternative A, the BLM would manage 3,840,300 acres as open to motorized travel and 31,800 acres as closed to motorized travel. The BLM would manage motorized travel on an additional 924,300 acres as limited to existing routes. Alternative A would manage the most acres as open to OHV

use and would manage the fewest acres as limited to existing routes than the other alternatives; therefore, Alternative A would result in higher emissions than the other alternatives, particularly fugitive dust emissions from cross-country travel.

Effects under Alternative B

Under Alternative B, the BLM would manage 95,300 acres as open to motorized travel and 26,700 acres as closed to motorized travel. The BLM would manage an additional 4,677,000 acres as motorized travel limited to existing routes. Alternative B would maintain the Lemmon Valley Motocross Area and would manage the Dead Camel Mountains, Hungry Valley, and portions of the Sand Mountain, Walker Lake, and Wilson SRMAs as open to motorized travel. In addition, the BLM would designate the Middlegate, Mina, Pine Nut, and Salt Wells ERMA for ATV, utility vehicle (UTV), and motorcycle long-distance trail riding and would provide OHV staging in the Reno Urban Interface ERMA. The overall level of recreation-related motorized travel would be similar to Alternative A, resulting in a similar level of criteria pollutant emissions from engine exhaust. However, limiting much of the travel to existing routes would prevent the creation of new trails and limit new sources of windblown dust.

Effects under Alternative C

Under Alternative C, the BLM would manage 1,300 acres as open to motorized travel and 1,190,500 acres as closed to motorized travel. The BLM would manage an additional 3,013,500 acres as motorized travel limited to existing routes. The BLM would eliminate the Lemmon Valley Motocross Area and would manage three SRMAs (Alpine, Sand Mountain, and Walker Lake) for recreation with an emphasis on protecting cultural, historical and natural resources. Nondesignated routes within the Dead Camel Mountains would be decommissioned. OHV use in Walker Lake SRMA would be limited to designated routes. Alternative C would likely result in a reduced level of recreation-related motorized use and a reduction in related criteria pollutant and fugitive dust emissions given the restrictions on use areas are current conditions.

Effects under Alternative D

Under Alternative D, the BLM would manage 22,700 acres as open to motorized travel and 30,600 acres as closed to motorized travel. The BLM would manage an additional 4,748,400 acres as motorized travel limited to existing routes. Similar to Alternative B, the overall level of recreation-related motorized travel would be similar to Alternative A, resulting in a similar level of criteria pollutant emissions from engine exhaust. However, limiting much of the travel to existing routes would prevent the creation of new trails and limit new sources of windblown dust.

Effects under Alternative E

Under Alternative D, the BLM would manage 55,700 acres as open to motorized travel and 24,100 acres as closed to motorized travel. The BLM would manage motorized travel on an additional 4,717,300 acres as limited to existing routes. Similar to Alternative B, the overall level of recreation-related motorized travel would likely be similar to Alternative A, resulting in a similar level of criteria pollutant emissions from engine exhaust. However, limiting much of the travel to existing routes would prevent the creation of new trails and limit new sources of windblown dust.

Air Quality: Effects from Comprehensive Travel and Transportation Management*Effects Common to All Alternatives*

Air quality impacts from the use of routes by motorized vehicles would be the same as described under *Effects from Recreation and Visitor Services*. Route maintenance activities, construction of new routes, or removal of existing routes would result in short-term fugitive dust and equipment engine emissions. Vehicle use levels in the planning area are expected to increase with the growing population in the planning area; therefore, exhaust-related emissions would continue to increase over the life of the RMP.

Effects under Alternative A

No travel management actions are proposed under Alternative A. Ongoing impacts would be the same as described under *Effects Common to All Alternatives*.

Effects under Alternatives B, C, D, and E

Alternatives B through E would establish travel management areas, with subsequent travel management planning occurring over the subsequent five years. Road closures and route designations that limit use to existing or designated roads, primitive roads, and trails would limit user creation of new trails and subsequent new sources of windblown dust in the planning area.

Air Quality: Effects from Renewable Energy*Effects Common to All Alternatives*

Solar and Wind Facilities. Impacts on air quality associated with solar and wind renewable energy development include construction-related emissions and, to a lesser extent, operational emissions. Individual renewable energy projects would result in short-term and long-term localized impacts at the project sites but would not contribute to regional degradation of air quality over the long term.

Construction of a solar facility includes a number of operations, with most air quality impacts occurring during site preparation (clearing, grading, and cut and fill if needed to produce acceptable slopes) and facility construction. The primary pollutants emitted during construction are fugitive dust from site

preparation, transmission line and road development, and vehicle and equipment use on unpaved surfaces, and exhaust emissions from construction equipment usage, construction worker commute traffic, and truck deliveries to the project site. Construction of a wind energy facility would result in similar emissions, though the primary source of fugitive dust emissions likely would occur during the construction of access roads, which sometimes must be developed through steeper terrain and may include blasting and cut and fill operations. Construction would be subject to Nevada surface area disturbance permit requirements and would require preparation of a fugitive dust control plan. Operation of photovoltaic solar facilities and wind facilities would result in negligible emissions, while operation of concentrated solar power facilities would result in emissions associated with small-scale boilers and cooling towers.

Biomass Facilities. Biomass can be used for direct heating, such as burning wood in a fireplace or wood stove, for generating electricity, or can be converted directly into liquid fuels. Within the planning area, there is potential for small-scale mobile biomass power production fueled by woody debris and plant matter from vegetation treatments. Within these systems, biomass materials would be converted into producer gas with a gasifier, filtered for tar and particulates, and directed to an engine to produce electricity. These systems would emit criteria pollutant emissions, including particulate matter, and would be subject to permitting conditions from the Nevada Bureau of Air Pollution Control.

Effects under Alternative A

Alternative A would manage the most acres as variance areas for utility-scale solar development (905,900 acres). Effects on air quality from utility-scale solar development would be the same as described under *Effects Common to All Alternatives*. Development in variance areas would be considered on a case-by-case basis based on environmental considerations and if approved for consideration would be required to undergo appropriate NEPA analysis (BLM and DOE 2012). There are no wind or biomass management actions under Alternative A.

Effects under Alternative B

Air quality impacts related to solar development would be similar to those described under Alternative A, though approximately 133,000 fewer acres would be managed as variance areas. Effects on air quality from utility-scale wind development would be the same as described under *Effects Common to All Alternatives*.

Effects under Alternative C

Air quality impacts related to solar development would be similar to those described under Alternative A. However, the BLM would manage approximately 327,500 fewer acres as variance areas. Effects on air quality from utility-scale

wind development would be the same as described under *Effects Common to All Alternatives*.

Effects under Alternative D

Air quality impacts related to solar development would be similar to those described under Alternative A. However, the BLM would manage approximately 234,000 fewer acres as variance areas. Effects on air quality from utility-scale wind development would be the same as described under *Effects Common to All Alternatives*.

Effects under Alternative E

Air quality impacts related to solar development would be similar to those described under Alternative A. However, the BLM would manage approximately 276,000 fewer acres as variance areas. Effects on air quality from utility-scale wind development would be the same as described under *Effects Common to All Alternatives*.

Air Quality: Effects from Back Country Byways

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

No air quality impacts would occur under Alternative A.

Effects under Alternative B

Designation and promotion of the Fort Churchill, Marietta, and New Pass to Hawthorne Back Country Byways would increase vehicle traffic along these routes, resulting in an increase in vehicle exhaust emissions and fugitive dust from travel on roadways.

Effects under Alternative C

Designation and promotion of the Marietta and New Pass to Hawthorne Back Country Byways would increase vehicle traffic along these routes, resulting in an increase in vehicle exhaust emissions and fugitive dust from travel on these roadways. Rescinding the Fort Churchill Back Country Byway designation may result in a decrease in visitor usage along this route and a subsequent decrease in emissions.

Effects under Alternative D

No air quality impacts would occur under Alternative D.

Effects under Alternative E

Impacts under Alternative E would be the same as under Alternative B.

Air Quality: Cumulative Effects

Cumulative air quality impacts occur when multiple projects affect the same geographic areas at the same time or when sequential projects extend the duration of air quality impacts on a given area over a longer period of time. Air quality monitoring data trends can predict future air quality conditions within the cumulative effects area. Attainment status of NAAQS is evaluated over three-year periods; measured levels of pollutant levels that occur in three consecutive years can trigger a change in attainment status.

Past and Present Actions

Past and present actions that have affected air quality in the planning area include invasive species, lands and realty (e.g., ROW development), livestock grazing, minerals exploration and development, renewable energy development, recreation including travel management, vegetation management, wild horse and burro management, and wild fire and ecology management. Past and present management actions related to multiple uses of public lands, particularly travel management, minerals and energy development, and other development actions, have resulted in short-term and long-term direct impacts on air quality from the introduction of air pollutant emission sources.

While increases in development have resulted in more sources of air pollutant emissions in the planning area, emission control standards for mobile equipment, emissions control equipment on stationary sources, and requirements for cleaner-burning fuels have resulted in improvements in air quality for pollutants such as carbon monoxide and ozone in some portions of the planning area.

Monitoring data for areas other than Washoe County show that ambient concentrations of carbon monoxide have decreased and are well below NAAQS; ambient concentrations of ozone have remained steady and are below NAAQS; ambient concentrations of PM_{2.5} have trended upward and are approaching NAAQS in some areas (Carson City and Gardnerville) but have decreased in other areas (Fernley); and ambient concentrations of PM₁₀ have decreased and remain below NAAQS. Monitoring data for Washoe County show that ambient concentrations of PM_{2.5} were at or above the NAAQS at monitored stations from 2003 to 2010 but below the NAAQS in 2011 and 2012. Ambient concentrations of ozone have remained steady at just below current NAAQS, though occasional exceedances of the 8-hour standard have occurred in the last 3 years. Ambient concentrations of carbon monoxide have decreased slightly and are well below NAAQS. The EPA sometimes revises the NAAQS based on new scientific information. The adoption of more stringent NAAQS by the EPA may affect the future attainment status of portions of the planning area.

Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions with the potential to affect air quality and air quality related values include new energy and mineral development, new geothermal development, new ROW development, increased recreation and visitor use and related travel on BLM-administered lands. In addition, climate change and wildland fire are processes or events that would result in indirect impacts on air quality and air quality related values similar to those described under *Nature and Types of Impacts*.

Incremental Cumulative Impact – Combined Past, Present, Reasonably Foreseeable Actions – All Alternatives

Past, present, and reasonably foreseeable future actions and conditions within the cumulative effects analysis area that have contributed to air pollutants include urban development, mineral development, energy development, recreation, and wildfire. Mineral development has occurred, is occurring, and will continue to occur on both federal and nonfederal mineral estate lands within the planning area. These actions have generally resulted in only minor effects on local air quality due to the dispersed nature of activities. However, air pollutant-generating activities that occur near urban areas contribute incrementally to elevated levels of criteria pollutants, particularly ozone and particulate matter. Required open burn permits, surface area disturbance permits, and stationary source permits would continue to limit impacts on air quality from emissions associated with fire treatments, mining, renewable energy, and other development within the cumulative effects area. Direct and immediate impacts on air quality from future wildfires would be affected by implementation of fuel treatments that would limit fire size. Soil rehabilitation efforts would continue to reduce blowing dust.

The incremental effects of management actions under all alternatives would be similar. Actions under all alternatives would be required to comply with state and federal air quality standards and requirements. Wildfire management actions that reduce fire size, spread, and frequency of occurrence would help reduce or stabilize smoke emissions. The number and intensity of wildfire and the amount of smoke emissions generated would be dependent on climate, weather, and increased potential for human-caused fires. Based on current monitoring trends, it is anticipated that incremental impacts would remain low, with ambient pollutant levels remaining in compliance with federal and state air quality standards in most of the assessment area.

The effects of climate change would result in a cumulative impact on air quality and air quality related values to the extent that climate change resulted in a change in hydrologic and other ecological regimes that altered the landscape in a manner that increased the potential for wildland fire.

4.3.2 Climate

Climate represents the long-term statistical characterization of daily, seasonal, and annual weather conditions such as temperature, relative humidity, precipitation, cloud cover, solar radiation, and wind speed and direction. Climate is the composite of generally prevailing weather conditions of a particular region throughout the year, averaged over a series of years. A region's climate is affected by its latitude, terrain, and altitude, as well as nearby water bodies and their currents.

Historical data within the Great Basin show an increase in mean annual temperature, with most of the change resulting from higher minimum temperatures rather than higher maximum temperatures. Most portions of the Great Basin show a warming of 0.6 to 1.1 degrees Fahrenheit (°F) over the past century (Chambers et al. 2008). Regional climate models typically predict an additional warming over the next century. Historical data also indicate an increase in annual precipitation amounts in the Great Basin over the past century, together with increased year-to-year variability in precipitation amounts and a decrease in winter snow pack. These changes have resulted in earlier snowmelt, higher winter streamflow volumes, reduced spring peak volumes, and lower summer and fall streamflow volumes. Warmer and more arid conditions, coupled with a shorter snow season, have led to limited water supplies and severe drought in parts of the region (Chambers et al. 2008).

Climate change poses challenges for many resources and resource uses on BLM-administered land over the long term. For example, increased temperatures, drought, and evaporation could result in a shift in elevation and direction of wildlife and habitat populations. It may reduce seasonal water supplies and impact forage availability. Drought and resulting stress on vegetation may increase the frequency and intensity of insect infestations and increase the threat of wildland fire. These factors in turn may influence the availability of resources for livestock grazing, hunting, pine nut gathering, or performing other recreational uses on BLM-administered lands.

Climate is thus both a driving force and a limiting factor for biological, ecological, and hydrologic processes, as well as for resource management activities such as disturbed site reclamation, wildland fire management, drought management, rangeland and watershed management, and wildlife habitat administration. Climate also influences renewable and nonrenewable resource management, affecting the productivity and success of many management activities on BLM-administered lands. Incorporating effective application of climate information into public lands programs, projects, activities, and decisions authorizing use of the BLM-administered lands is critical for effective management.

In February 2010, DOI issued Amendment I to Secretarial Order 3289 directing the BLM to address the impacts of climate change on water, land, and other

resources. Management planning made in response to climate change impacts must be informed by science, and must require that scientists work with managers who are confronting this issue to evaluate impacts through the NEPA process. One of the tasks within the Order requires each bureau and office within the department to consider and analyze the potential climate change impacts in planning exercises and when making decisions affecting department resources.

Summary

A variety of actions within the planning area generate greenhouse gas emissions. The primary sources of greenhouse gas emissions on BLM-administered lands in the planning area under all alternatives would be combustion sources such as vehicles, construction equipment, and maintenance equipment; enteric fermentation from domestic livestock on grazing allotments and, to a lesser extent, from wild horses and burros; and fire.

Proposed vegetation treatments, wildland fire, livestock grazing, wild horse and burros, mineral resources, recreation, and travel management actions would emit greenhouse gases in the planning area, while proposed vegetation and wildland fire management actions that create healthy vegetation and soils would sequester greenhouse gases.

Each alternative evaluated in the RMP would contain actions that emit greenhouse gases and release carbon into the atmosphere as well as actions that improve soil and vegetation conditions and thus improve carbon sinks in the area. In general, alternatives that emphasize development would likely result in more greenhouse gas emissions over existing conditions, while alternatives that emphasize conservation would result in fewer emissions of greenhouse gas emissions and less disturbance of vegetation. Current scientific technology makes it difficult to link a specific BLM action to a specific climate change-related impact. Emissions of greenhouse gases from proposed BLM actions would be small in the context of broader spatial-scale emissions, and the duration of most BLM actions would be shorter than predicted changes in climatic conditions. Short-term direct and indirect impacts on climate from any of the alternatives would be negligible. However, over the long term, greenhouse gas emissions from actions on BLM-administered lands do contribute to total global emission levels. These, in turn, could contribute to future long-term, anticipated climate changes to a very minor degree. Overall, the contribution would be a very small portion of the total from other sources of a regional and global nature.

Potential effects of climate change on specific resources and resource uses in the planning area are discussed under their respective sections of this chapter.

Methods of Analysis

Methods and Assumptions

A qualitative approach was used for analyzing climate impacts. The potential effects of management actions were evaluated by assessing the impacts of anticipated future actions on the production of greenhouse gas emissions.

The analysis includes the following assumptions:

- There is a correlation between global concentrations of greenhouse gases and climate change.
- Future changes in precipitation and temperature regimes due to climate change will result in changes in vegetation, fire and fuels, and water availability.
- BMPs will be implemented for site-specific actions as applicable to the specific project and site location to minimize construction- and operation-related equipment emissions. This will also minimize combustion-related greenhouse gas emissions.

Indicators

The primary indicator of greenhouse gas-related impacts is the potential for the proposed action and alternatives to increase or decrease long-term levels of greenhouse gases.

Nature and Type of Effects

Greenhouse gases are gases that contribute to the natural greenhouse effect, including carbon dioxide, methane, nitrous oxide, and water vapor, as well as manufactured gases such as hydrofluorocarbons, chlorinated fluorocarbons, and sulfurhexafluoride.

Actions that increase greenhouse gas emissions, actions that reduce greenhouse gas emissions, actions that create carbon sinks, and actions that remove carbon sinks could affect climate change. The primary sources of greenhouse gas emissions on BLM-administered lands are combustion sources such as vehicles (including OHVs), construction equipment, and maintenance equipment; enteric fermentation from domestic livestock on grazing allotments and from wild horses and burros; and fire.

Fuel-burning equipment (e.g., personal vehicles, trucks, OHVs, ATVs, motorcycles, construction equipment, maintenance equipment, and mining equipment) releases primarily carbon dioxide as well as small amounts of methane. Ruminant livestock such as cattle and sheep are a primary source of methane emissions in the US; in 2010, enteric fermentation and manure management represented about 21 percent and 8 percent of total methane emissions from anthropogenic activities, respectively (EPA 2012). Nonruminant animals, such as wild horses and burros, also produce methane emissions but at

a much lower level (EPA 2012). Fires, particularly uncontrolled fires, can emit large quantities of greenhouse gases into the atmosphere, including carbon dioxide, methane, and nitrous oxide; fires also remove vegetation that acts as a carbon sink. In the long term, controlling fuel load through prescribed burns and vegetation treatments reduces the risk of uncontrolled wildfire and the resultant release of greenhouse gases into the atmosphere (Wiedinmyer and Hurteau 2010).

Proposed vegetation treatments, mineral resources development, recreation, and travel management actions would also emit greenhouse gases in the planning area, while proposed vegetation and wildland fire management actions that create healthy vegetation and soils would sequester greenhouse gases.

Vegetation management actions that involve reducing juniper woodland encroachment would also contribute to climate change. Woodlands tend to store more carbon due to greater aboveground biomass and greater total root biomass (Pinno and Wilson 2011). Because woodlands tend to store more carbon due to greater aboveground biomass and greater total root biomass, removal of the woodland and conversion to another plant community would reduce carbon storage potential. However, as described above, controlling fuel load through vegetation treatments also reduces the risk of uncontrolled wildfire and the resultant release of greenhouse gases into the atmosphere (Wiedinmyer and Hurteau 2010).

Construction of solar energy facilities emit greenhouse gas emissions from fuel combustion associated with heavy construction equipment and vehicle and truck use. Greenhouse gas emissions associated with operation of solar facilities would be much less than during construction. Because solar facilities operate for decades with minimal production of greenhouse gases, the potential greenhouse gas savings in the form of offsetting energy produced by coal or natural gas sources outweighs life-cycle emissions of greenhouse gases.

Construction of geothermal energy facilities would also be a source of greenhouse gas emissions resulting from fuel combustion associated with heavy construction equipment, drilling equipment, and vehicle and truck use, as well as from the release of carbon dioxide and lesser amounts of other greenhouse gases contained within the geothermal resources itself. Geothermal power plants utilizing binary technology do not release greenhouse gases from the geothermal production process itself, while plants utilizing flash steam or dry steam technologies release low levels of greenhouse gas emissions. Like solar power, energy from geothermal power sources releases far fewer greenhouse gas emissions than coal or natural gas-fired power plants.

Biomass facilities release greenhouse gases from the removal and combustion of vegetative materials.

Management for the following resources would not result in an effect on climate: air quality, climate change, fish and wildlife, caves and cave resources, paleontological resources, lands and realty, national trails, WSAs, WSRs, back country wildlife conservation areas, tribal interests, public health and safety, and interpretation and education.

Climate: Effects from Soil Resources

Effects Common to All Alternatives

Soil resources are carbon sinks, and removal of vegetation and biotic soil crusts releases the organic carbon within the soil. The greater the surface disturbance, the more carbon would be released.

Effects under Alternative A

Actions under Alternative A that limit new surface disturbance in areas particularly susceptible to erosion would reduce soil erosion and thus limit the release of carbon stored in the vegetation and soils.

Effects under Alternative B

Alternative B would maintain and improve vegetation cover in areas of high erosion potential. To the extent that Alternative B would result in increased vegetation, more vegetative matter would be available to sequester carbon.

Effects under Alternative C, D, and E

Vegetation management actions that improve and increase vegetation cover under Alternatives C through E would result in the greatest potential to control soil erosion. To the extent that Alternatives C through E would result in increased vegetation, more vegetative matter would be available to sequester carbon.

Climate: Effects from Water Resources

Effects under Alternative A

No climate change impacts from water resource management were identified under Alternative A.

Effects under Alternative B, C, D, and E

Water resources actions would be short-term sources of greenhouse gas emissions during construction of well importation or exportation projects, wells, or other water sources. Use of fuel burning equipment would emit greenhouse gas emissions from equipment exhaust. No long-term increase in greenhouse gas emissions would occur from water resources management under any of these alternatives.

Climate: Effects from Vegetation Resources***Effects Common to All Alternatives***

Vegetation is the primary carbon sink within the planning area. Removal of vegetation releases the soil organic carbon and the carbon stored in the vegetation. The amount of carbon released depends on the type of soil and vegetation and the vegetation that replaces it. As described under *Nature and Type of Effects*, woody vegetation stores more carbon than grasses. Thus, pinyon-juniper would store more carbon than sagebrush, while sagebrush would store more carbon than cheatgrass.

Vegetation management would require the use of vehicles, chainsaws, and other equipment powered by nonrenewable fuels, which results in greenhouse gas emissions. Vegetation treatment using fire releases carbon from plants. At the same time, treatments that improve vegetative communities in the long term could increase rates of carbon sequestration, thus mitigating some of the negative climate change effects.

Effects under Alternative A

Vegetation management under Alternative A focuses on meeting rangeland health standards and enhancing rangeland health for all rangeland values, including livestock, wildlife, and wild horses. It includes fewer vegetation management actions and may be less effective at improving vegetation health and thus long-term reductions in wildland fire potential and associated climate change-related impacts discussed under *Nature and Type of Effects*.

Effects under Alternative B

Alternative B would emphasize resource use and development over other values. As such, management actions under this alternative have a higher potential for vegetation removal than under Alternative A. Under Alternative B, as many as 20,000 acres of low-density pinyon-juniper woodland would be converted to sagebrush-dominated communities per year and as many as 6,500 acres of medium- and high-density pinyon-juniper woodlands would be thinned per year. This alternative would convert the greatest amount of woodland to shrubland and would thus emit the most carbon from vegetative and soil sources. Alternative B would manage woodlands to maximize sustained yield of forest products and allow the most harvesting of economically valuable species. This would result in more release of carbon than Alternative A. In addition, Alternative B would prioritize mineral extraction, energy development, or forage production over maintaining sagebrush communities. Mineral and energy development would remove vegetation during development and would likely not replace it during operation, while forage production may convert sagebrush to species that store less carbon.

Vegetation treatments using mechanical means would release greenhouse gas emissions from equipment usage, and prescribed fire treatments would emit

carbon dioxide, methane, and nitrous oxide. Over the long term, management actions that reduce fuel load and improve woodland health would reduce the potential for wildland fires and associated impacts. In addition, restoration and rehabilitation actions that stabilize soils and prevent cheatgrass and invasive species from dominating burned areas and altering the natural fire regime would create more stable long-term carbon storage, resulting in a long-term benefit.

Effects under Alternative C

Alternative C would emphasize preservation over other values, lower the potential for vegetation removal, and focus on improving vegetative health compared to Alternative A. Under Alternative C, as many as 3,500 acres of low-density pinyon-juniper woodland would be removed per year and as many as 1,500 acres of medium- and high-density pinyon-juniper woodlands would be thinned per year. Extraction of wood products would be allowed, but only for personal use. Alternative C would avoid the disturbance, loss, or degradation of riparian, wetland, and associated floodplain and would close riparian areas to woodcutting or any other vegetative removal, except for beneficial uses. Riparian areas would also close riparian areas to mineral development and manage the area as ROW exclusion. These management actions would all preserve vegetation over other developed uses.

Alternative C would manage woodlands to emphasize forest health, which could reduce fuel load and the climate change-related impacts that occur with wildland fire (see *Nature and Type of Effects*).

Vegetation treatments using mechanical means would release greenhouse gas emissions from equipment usage, and prescribed fire treatments, if used, would emit carbon dioxide, methane, and nitrous oxide. Over the long term, management actions that reduce fuel load and improve woodland health would reduce the potential for wildland fires and associated impacts. In addition, restoration and rehabilitation actions that stabilize soils and prevent cheatgrass and invasive species from dominating burned areas and altering the natural fire regime would create more stable long-term carbon storage, a long-term benefit.

Effects under Alternative D

Alternative D would focus on reducing impacts in the urban interface. As such, many management actions would be designed to reduce the potential for wildland fire in this area through the reduction of fuel loads. Release of carbon when vegetation is removed greenhouse gas emissions from equipment used to perform the removal would result in short-term impacts. Reducing fuel loads and the chance of fire next to communities would reduce the chance of wildfire and its associated climate effects over the long term (see *Nature and Type of Effects*).

The BLM would engage interested parties to develop a comprehensive restoration strategy prior to further treatment of pinyon-juniper woodlands; therefore, the types of treatments under this alternative and their associated

effects are not known at this time. Outside of the urban interface, the BLM would manage woodlands with a focus on scenic values, recreation, wildlife habitat enhancement over economic development uses, with climate change benefits similar to those described under Alternative C.

Alternative D would use mechanical, biological, and chemical means to eradicate or control invasive species. Impacts would be similar to those described for Alternative B.

Effects under Alternative E

Alternative E strives to balance the focus of management actions without emphasizing one resource or resource use over another. Impacts from forest and woodlands treatments would be similar to those described under Alternative B but would occur on a reduced scale. Under Alternative E, as many as 8,500 acres of low-density pinyon-juniper woodland would be removed per year, and as many as 6,500 acres of medium and high-density pinyon-juniper woodlands would be thinned per year. This alternative would convert more woodland to shrubland than Alternative A and would thus emit more carbon from vegetative and soil sources. Alternative E would manage woodlands for forest health concerns, wildlife needs, recreation, and fuel hazard reduction. This would result in releases of carbon similar to those under Alternative A. Managing for fuel hazard reduction could reduce fuel load and the resultant climate change-related impacts that occur with wildland fire (see *Nature and Type of Effects*).

Vegetation treatments would use the full suite of mechanical, hand, and prescribed fire treatments. Treatments that use mechanical means would release greenhouse gas emissions from equipment usage, and prescribed fire treatments would emit carbon dioxide, methane, and nitrous oxide. Over the long term, management actions that reduce fuel load and improve woodland health would reduce the potential for wildland fires and associated impacts. In addition, restoration and rehabilitation actions that would stabilize soils and prevent cheatgrass and invasive species from dominating burned areas and altering the natural fire regime would create more stable long-term carbon storage, a long-term benefit.

Climate: Effects from Special Status Species Management

Effects under Alternative A

There are no management actions pertaining to special status species that would affect climate change under Alternative A.

Effects under Alternative B, C, D, and E

Implementing management to protect Greater Sage-Grouse generally involves reducing or otherwise restricting land uses and activities that generate greenhouse gases, resulting in beneficial climate change effects. Management actions under all alternatives would limit or prohibit the use of prescribed fire

with preliminary priority management areas (PPMAs) and preliminary general management areas (PGMAs), would apply stipulations and timing limitations for fluid mineral leasing, and would manage PPMAs and PGMAs as either ROW avoidance or ROW exclusion areas. Under all alternatives, management actions that involve reducing pinyon-juniper encroachment into Greater Sage-Grouse habitat could also affect climate change. Woodlands tend to store more carbon due to greater aboveground biomass and greater total root biomass (Pinno and Wilson 2011). Due to this, a conversion of habitat type from woodland to shrubland would release carbon during woodland removal and could result in a decrease in carbon storage capacity of these areas.

Climate: Effects from Wild Horse and Burro Management

Effects Common to All Alternatives

Management actions for wild horses and burros would result in few impacts on climate change under all alternatives. Gather and removal actions would be a temporary source of greenhouse gas emissions from vehicle and equipment use related to gathers. Wild horses and burros themselves are a minor source of methane emissions from digestion and manure decomposition (EPA 2012). The BLM would manage similar numbers of wild horses and burros under all alternatives.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Climate: Effects from Wildland Fire Ecology and Management

Effects Common to All Alternatives

The effects from wildland fire on climate change would be the same as described under *Nature and Type of Effects*. It is difficult to accurately predict the number and extent of wildland fires that would occur over the life of this RMP. However, trends in wildland fires in the planning area over the last 30 years show that the acres burned in the planning area have decreased slightly in the decades between 1980 and 2013, while the percentage of those acres on BLM-administered lands has increased slightly in the same period. On average, less

than 1 percent of the CCD is affected by wildland fire each year. While management actions under the different alternatives may affect the size, frequency, and location of future wildland fires, wildland fire trends of the last 30 years would likely continue over the life of this RMP.

Any use of prescribed fire to meet the goals and objectives of wildland fire management, such as to restore fire frequency and intensity regimes and to reduce hazardous fuel buildup, would emit greenhouse gases into the atmosphere. Conversely, wildland fire management that results in healthier vegetation communities could increase rates of greenhouse gas sequestration, thus mitigating climate change effects.

Impacts on climate change from wildland fire management will vary by alternative based on the extent to which prescribed fire is proposed to be used. Alternatives that increase frequency or duration of fire use could result in increased greenhouse gas emissions, at least in the short term.

Effects under Alternative A

Alternative A includes fuels treatments to reduce fire hazard fuels as well as fire suppression in the event of a wildland fire. Impacts from wildland fires and prescribed burns would be the same as described under *Nature and Type of Effects*. In addition, vehicles and other equipment used in fuels treatment activities; vehicles, construction equipment (such as to create fire breaks), and aircraft used in fire suppression activities; and vehicles and construction equipment used in post-fire land stabilization activities would emit small amounts of greenhouse gas emissions during operation of this equipment.

Effects under Alternative B

Impacts under Alternative B would be similar to Alternative A. The incidence of fire would be expected to follow existing trends.

Effects under Alternative C

Impacts under Alternative C would be similar to Alternative A. Prescribed burns would likely be used less in this alternative, and chemical agents and dozers generally would not be used in fire suppression actions; this slightly reduce greenhouse gas emissions compared to Alternative A. However, if these restrictions increased the duration of the fire or the acres burned, then more greenhouse gases would be emitted to the atmosphere. The incidence of fire would be expected to follow existing trends.

Effects under Alternative D

Impacts under Alternative D would be similar to Alternative A. Alternative D would focus on protecting the WUI from wildfire. The focus on these areas could reduce the incidence on human-caused fire. The incidence of fire would be expected to follow existing trends.

Effects under Alternative E

Impacts under Alternative E would be similar to Alternative A. Alternative E would utilize all fuels treatments methods to create fire safe communities and modify vegetation communities to achieve condition class, fuels, habitat, watershed, and riparian objectives. This focus on both urban and rural areas may lead to fewer wildfires over the long term, though the incidence of fire would be expected to follow existing trends over the life of the RMP.

Climate: Effects from Cultural Resources Management*Effects Common to All Alternatives*

Cultural resource management actions would result in negligible impacts on climate. Excluding areas from surface-disturbing activities to protect sensitive cultural resources may reduce vegetation and soil loess and resultant carbon release that may be associated with surface disturbance. These exclusions are described in **Section 4.3.1**, Air Quality, Resource: *Effects from Cultural Resources Management*.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Climate: Effects from Visual Resources Management*Effects Common to All Alternatives*

Management actions to improve and protect visual resources could reduce greenhouse gas emissions through limitations on surface disturbing activities. Such limitations would reduce greenhouse gas emissions from construction activities and would maintain existing vegetative communities that could act as greenhouse gas sinks. Impacts from visual resource management on climate change will vary by alternative based on the number of acres allocated to each VRM class. Alternatives that increase acreage allocated as VRM Class I or II could result in decreased greenhouse gas emissions.

Effects under Alternative A

VRM actions under Alternative A would not result in impacts on climate change.

Effects under Alternative B

Alternative B would manage the same acreage as Class I and nearly 20,000 more acres as Class II than Alternative A and would thus allow similar levels of use and associated greenhouse gas emissions.

Effects under Alternative C

Alternative C would manage slightly more acreage as Class I and almost 700,000 more acres as Class II than Alternative A. Limitations on development in Class II areas would likely allow fewer uses that would remove vegetation through surface disturbance or generate greenhouse gas emissions.

Effects under Alternative D

Impacts would be similar to those described under Alternative B.

Effects under Alternative E

Alternative E would manage the same acreage as Class I and approximately 475,000 more acres as Class II compared to Alternative A. Limitations on development in Class II areas would likely allow fewer uses that would remove vegetation through surface disturbance or generate greenhouse gas emissions.

Climate: Effects from Forestry and Woodland Product Management

Effects Common to All Alternatives

The types of climate impacts from forestry and woodland product management would be the same as described under *Climate: Effects from Vegetation Resources Management* for removal of vegetation and resultant release of carbon into the atmosphere. The level of removal would be similar under all alternatives.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Climate: Effects from Livestock Grazing Management*Effects Common to All Alternatives*

Livestock is a source of methane emissions from digestive fermentation and manure decomposition. Livestock grazing operations, including the transport of livestock, would be a temporary source of greenhouse gases from vehicle emissions.

Effects under Alternatives A, B, D, and E

Alternatives A, B, D, and E would manage a similar number of acres as available or not available for livestock grazing. Impacts would be as described under *Effects Common to All Alternatives*.

Effects under Alternative C

Alternative C would reduce the number of acres available for grazing by approximately 56 percent and would reduce AUMs to no more than 27 percent of existing levels, resulting in fewer methane emissions related to livestock grazing on BLM-administered lands within the planning area. However, decreases in AUMs on BLM-administered lands would not decrease overall greenhouse gas emissions if livestock were moved to other lands in the planning area.

Climate: Effects from Geology and Mineral Management*Effects Common to All Alternatives*

Mining and mineral extraction activities in the planning area would be sources of greenhouse gas emissions from equipment and vehicle exhaust emissions and from removal of vegetative greenhouse gas sinks by removing ground cover in portions of developed areas.

The CCD is an active geothermal resource area. Sources of greenhouse gas emissions associated with geothermal development include construction equipment and vehicle exhaust, well drilling, which includes greenhouse gas emissions from the drill rigs as well as noncondensable gases such as carbon dioxide and methane when these compounds are contained in the geothermal resource. Emissions associated with operation of geothermal power plants depend on the type of plant constructed. Binary heat transfer systems are closed loop systems and have few emissions. Flash steam systems are not closed systems and emit steam and minerals contained in geothermal fluids to the atmosphere. Small quantities of gases such as methane may be emitted, depending on the characteristics of the geothermal resource.

Impacts from mineral resource management on climate change would vary by alternative based on the acreage open or closed to mineral development and on surface disturbance limitations in areas open to mineral development. Alternatives proposing more acreage open to mineral development could result in increased greenhouse gas emissions. Best management practices, design

features, and standard operating procedures would be applied to specific mineral exploration and development proposals, and climate change impacts would be evaluated during implementation-level environmental analyses of these proposals.

Effects under Alternative A

Impacts under Alternative A would be the same as discussed under *Effects Common to All Alternatives*.

Effects under Alternative B

Impacts under Alternative B would be the same as discussed under *Effects Common to All Alternatives*. Alternative B manage a similar number of acres open to fluid mineral leasing but would manage more acres as subject to NSO or CSU stipulations than Alternative A. Alternative B would also manage more acres as closed to nonenergy leasable mineral exploration or development, 439,600 acres as petitioned for withdrawal from locatable mineral entry, and the same number of acres closed to mineral material entry. Management actions that place restrictions on mineral extraction and exploration activities would reduce the levels of greenhouse gases generated and carbon released to the atmosphere. Closing additional areas to mineral development and limiting surface-disturbing actions in areas open to fluid mineral leasing would result in fewer emissions associated with exploration and development of minerals.

Effects under Alternative C

Impacts under Alternative C would be the same as discussed under *Effects Common to All Alternatives*. Alternative C would manage fewer acres as open to fluid mineral leasing and would manage more acres as subject to NSO or CSU stipulations than Alternative A. Alternative C would also manage 2,960,800 acres as closed to nonenergy leasable mineral exploration or development, 117,500 acres petitioned for withdrawal from locatable mineral entry, and 3,004,800 acres closed to mineral material entry. Alternative C would close the most acreage and place the highest level of restrictions on actions that would emit air pollutants resulting in the lowest greenhouse gas emissions related to mineral development compared to the other alternatives.

Effects under Alternative D

Impacts under Alternative D would be the same as discussed under *Effects Common to All Alternatives*. The acreages open and closed to mineral development would be similar to those described under Alternative B, except Alternative D would petition fewer acres for mineral withdrawal.

Effects under Alternative E

Impacts under Alternative E would be the same as discussed under *Effects Common to All Alternatives*. Alternative E would manage more acres as closed to fluid mineral leasing than Alternative A. It also would manage over twice as many acres as closed to nonenergy leasable mineral exploration or development and mineral material entry as Alternative A. In addition, Alternative E would

manage 470,600 acres as petitioned for withdrawal from locatable mineral entry. Alternative E would close the second most acreage and would place the greatest level of restrictions on actions that would emit air pollutants compared to the other alternatives, resulting in the lowest emissions related to mineral development. Management actions under Alternative E would result in fewer greenhouse gas emissions associated with exploration and development of minerals than under Alternative A.

Climate: Effects from Recreation and Visitor Services

Effects Common to All Alternatives

Recreation results in greenhouse gas emissions from vehicles and wood-burning campfires. Recreation sites may also contribute to greenhouse gas emissions through removal of greenhouse gas sinks where vegetation is damaged or removed. Based on annual visitor use days, OHV travel is the most popular recreational activity in the planning area. Motorboats, motocross, pleasure driving, campfires, and camp stoves are additional sources of greenhouse gas emissions associated with recreational visitor activities. Impacts from recreation management on climate change would vary by alternative based on the acreage open or closed to recreation activities and on development of recreation facilities.

Increasing the acreage open to motorized vehicle use (e.g., OHVs, ATVs, and motorcycles) would result in increased greenhouse gas emissions. Further restricting vehicle use could result in decreased greenhouse gas emissions from motorized vehicles if such restrictions actually decrease motor vehicle use rather than just concentrating the use in a smaller area. Impacts on climate change would vary by alternative based on the miles of open or closed routes. Alternatives that decrease the acreage open to motorized travel could result in reduced greenhouse gas emissions, while alternatives that increase the acreage open to motorized travel could result in increased greenhouse gas emissions.

Effects under Alternative A

Under Alternative A, the BLM would manage 3,840,300 acres as open to motorized travel and 31,800 acres as closed to motorized travel. Motorized travel would be managed as limited to existing routes on an additional 924,300 acres. Alternative A would manage the most acres as open to OHV use and the fewest acres as limited to existing routes than the other alternatives; therefore, Alternative A may result in higher greenhouse gas emissions than the other alternatives. Visitor use levels for other recreation-related activities are expected to rise with increasing populations in the planning area. Greenhouse gas emissions related to these activities, primarily vehicle travel to recreation areas, would likely increase.

Effects under Alternative B

Under Alternative B, the BLM would manage 95,300 acres as open to motorized travel and 26,700 acres as closed to motorized travel. Motorized travel would be managed as limited to existing routes on an additional 4,677,000 acres. The overall level of recreation-related motorized travel would likely be similar to Alternative A, resulting in a similar level of greenhouse gas emissions from engine exhaust. Visitor use levels for other recreation-related activities are expected to rise with increasing populations in the planning area. Greenhouse gas emissions related to these activities, primarily vehicle travel to recreation areas, would likely increase.

Effects under Alternative C

Under Alternative C, the BLM would manage 1,300 acres as open to motorized travel and 1,190,500 acres as closed to motorized travel. Motorized travel would be managed as limited to existing routes on an additional 3,013,500 acres. Alternative C would likely result in a reduced level of recreation-related motorized use and a reduction in related greenhouse gas emissions given the restrictions on use over current conditions. Visitor use levels for other recreation-related activities are expected to rise with increasing populations in the planning area. Greenhouse gas emissions related to these activities, primarily vehicle travel to recreation areas, would likely increase.

Effects under Alternative D

Under Alternative D, the BLM would manage 22,700 acres as open to motorized travel and 30,600 acres as closed to motorized travel. Motorized travel would be managed as limited to existing routes on an additional 4,748,400 acres. Similar to Alternative B, the overall level of recreation-related motorized travel would likely be similar to Alternative A, resulting in a similar level of emissions from engine exhaust. Visitor use levels for other recreation-related activities are expected to rise with increasing populations in the planning area. Greenhouse gas emissions related to these activities, primarily vehicle travel to recreation areas, would likely increase.

Effects under Alternative E

Under Alternative E, the BLM would manage 55,700 acres as open to motorized travel and 24,100 acres as closed to motorized travel. Motorized travel would be managed as limited to existing routes on an additional 4,717,300 acres. Similar to Alternative B, the overall level of recreation-related motorized travel would likely be similar to Alternative A, resulting in a similar level of criteria pollutant emissions from engine exhaust. Visitor use levels for other recreation-related activities are expected to rise with increasing populations in the planning area. Greenhouse gas emissions related to these activities, primarily vehicle travel to recreation areas, would likely increase.

Climate: Effects from Comprehensive Travel and Transportation Management*Effects Common to All Alternatives*

Air quality impacts from the use of routes by motorized vehicles would be the same as described under *Effects from Recreation and Visitor Services*. Route maintenance activities, construction of new routes, or removal of existing routes would result in short-term greenhouse gas emissions from equipment exhaust. Vehicle use levels in the planning area are expected to increase with the growing population in the planning area; therefore, exhaust-related greenhouse gas emissions would continue to increase over the life of the RMP.

Effects under Alternative A

No travel management actions are proposed under Alternative A. Ongoing impacts would be the same as described under *Effects Common to All Alternatives*.

Effects under Alternatives B, C, D, and E

Alternatives B through E would establish travel management areas, with subsequent travel management planning occurring over the subsequent five years. Road closures and route designations that limit use to existing or designated roads, primitive roads, and trails would limit user creation of new trails and subsequent disturbance of vegetation and soils.

Climate: Effects from Renewable Energy*Effects Common to All Alternatives*

Solar and Wind Facilities. Impacts on climate change associated with solar and wind renewable energy development include construction-related greenhouse gas emissions and, to a lesser extent, operational greenhouse gas emissions.

Construction of a solar facility includes a number of operations, with most climate impacts occurring from clearing of vegetation during site preparation, which releases sequestered carbon into the atmosphere. Facility construction is also a source of greenhouse gas emissions from equipment used for site preparation, transmission line and road development, and solar field development, as well as worker commute traffic and truck deliveries to the project site. Construction of a wind energy facility would result in similar impacts but would require less removal of vegetation, as wind facilities generally have smaller footprints. Operation of solar and wind facilities would result in negligible greenhouse gas emissions. As discussed under *Nature and Type of Effects*, the potential greenhouse gas savings in the form of offsetting energy produced by coal or natural gas sources outweighs life-cycle emissions of greenhouse gases because solar and wind facilities operate for decades with minimal production of greenhouse gases.

Biomass Facilities. Biomass can be used for direct heating, such as burning wood in a fireplace or wood stove, for generating electricity, or can be converted directly into liquid fuels. Within the planning area, there is potential for small-scale mobile biomass power production fueled by woody debris and plant matter from vegetation treatments. Within these systems, biomass materials would be converted into producer gas with a gasifier, filtered for tar and particulates, and directed to an engine to produce electricity. These systems would emit carbon from the harvesting of biomass and greenhouse gas emissions from the operation of the facility.

Effects under Alternative A

Alternative A would manage the most acres as variance areas for utility-scale solar development (905,900 acres). Effects would be the same as described under *Effects Common to All Alternatives*.

Effects under Alternative B

Impacts related to solar development would be similar to those described under Alternative A. However, the BLM would manage approximately 133,000 fewer acres as solar variance areas. Effects on air quality from utility-scale wind development would be the same as described under *Effects Common to All Alternatives*.

Effects under Alternative C

Impacts related to solar development would be similar to those described under Alternative A. However, the BLM would manage approximately 327,500 fewer acres as variance areas. Effects would be the same as described under *Effects Common to All Alternatives*.

Effects under Alternative D

Impacts related to solar development would be similar to those described under Alternative A. However, the BLM would manage approximately 234,000 fewer acres as variance areas. Effects would be the same as described under *Effects Common to All Alternatives*.

Effects under Alternative E

Impacts related to solar development would be similar to those described under Alternative A. However, the BLM would manage approximately 276,000 fewer acres as variance areas. Effects would be the same as described under *Effects Common to All Alternatives*.

Climate: Effects from Areas of Critical Environmental Concern

Effects Common to All Alternatives

Designating ACECs could reduce greenhouse gas emissions because the designated areas would be managed with increased use restrictions to protect the values for which they were designated. ACECs would be designated for biological, historic, cultural, paleontological, or scenic values; fish and wildlife

resources; other natural systems or processes; or to protect life and safety from natural hazards.

Restrictions could include ROW exclusion or avoidance, limits on motor vehicle use (including OHVs), limits on mining or other development, or adjustments to grazing, depending on the value to be protected. Such limits would reduce carbon release from vegetation removal and would decrease greenhouse gas emissions from fuel burning equipment to the extent the developed uses were not allowed. Such limitations could also increase greenhouse gas sequestration by leaving vegetative communities intact. Impacts from special designations on climate change would vary by alternative based on the acreage proposed for special designation. Alternatives with increased acreage as special designations could result in decreased greenhouse gas emissions.

Effects under Alternative A

Management actions under Alternative A would not result in impacts on climate change. Under Alternative A, 21,800 acres are currently designated in 6 ACECs.

Effects under Alternative B

Alternative B would designate 371,170 acres in 12 ACECs, nearly 350,000 more acres than Alternative A. Limitations on development or use in these areas would likely allow fewer uses that would remove vegetation through surface disturbance or generate greenhouse gas emissions.

Effects under Alternative C

Alternative C would designate 786,270 acres in 22 ACECs, nearly 760,000 more acres than Alternative A. Limitations on development or use in these areas would likely allow fewer uses that would remove vegetation through surface disturbance or generate greenhouse gas emissions.

Effects under Alternative D

Alternative D would designate 180,000 acres in 11 ACECs, nearly 160,000 more acres than Alternative A. Limitations on development or use in these areas would likely allow fewer uses that would remove vegetation through surface disturbance or generate greenhouse gas emissions.

Effects under Alternative E

Alternative E would designate 82,770 acres in 9 ACECs, over 60,000 more acres than Alternative A. Limitations on development or use in these areas would likely allow fewer uses that would remove vegetation through surface disturbance or generate greenhouse gas emissions.

Climate: Effects from Back Country Byways

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

No impacts would occur under Alternative A.

Effects under Alternative B

Designation and promotion of the Fort Churchill, Marietta, and New Pass to Hawthorne Back Country Byways would increase vehicle traffic along these routes, resulting in an increase in greenhouse gas emissions from vehicle use.

Effects under Alternative C

Designation and promotion of the Marietta and New Pass to Hawthorne Back Country Byways would increase vehicle traffic along these routes, resulting in an increase in greenhouse gas emissions from vehicle use. Rescinding the Fort Churchill Back Country Byway designation may result in a decrease in visitor usage along this route and a subsequent decrease in emissions.

Effects under Alternative D

No impacts would occur under Alternative D.

Effects under Alternative E

Impacts under Alternative E would be the same as under Alternative B.

Climate: Cumulative Effects

Primary climate change indicators that can be monitored include ambient air temperature, precipitation amounts and timing, annual snow pack levels, and stream flow volume and timing. The trends in climate change within the planning area discussed in **Section 3.2.2, Climate**, would continue under all alternatives. Current management policy and direction is to address climate change in long-range planning efforts. Cumulative effects on resources and resource uses resulting from climate change are discussed under those topic areas in the cumulative effects analysis, particularly for vegetation, fish and wildlife, including special status species, and water resources, for which climate change-related management actions have been proposed.

By its nature, climate change is a cumulative impacts issue. Individual local greenhouse gas emissions cannot be considered outside of the larger context of global cumulative emissions. As discussed at the beginning of this section, the precise link between potential emissions from BLM-proposed actions and specific impacts on or from global climate change is not known. However, it is known that some proposed actions would likely increase or decrease greenhouse gas levels in the atmosphere if implemented. Past, present, and reasonably foreseeable future actions and conditions within the cumulative effects analysis area that have contributed greenhouse gases to the atmosphere include urban development (population increases spurring development), mineral development, energy development, fossil-fuel burning (primarily transportation-related use), livestock, and wildfire. These are discussed below.

Past and Present Actions

Mineral and energy development has occurred and is occurring on both federal and nonfederal lands within the planning area. Mineral and energy development result in short-term and long-term emissions of greenhouse gases during fuel combustion in vehicles, drill rigs, and construction equipment. These sources are expected to grow on both federal and nonfederal lands within the planning area. As described in **Section 3.2.2, Climate**, electrical power generation is the largest source of greenhouse gases in both the US and in Nevada (32 percent in the US [EPA 2014a] and 38 percent in Nevada [NDEP 2012a]).

Transportation is the second largest source of greenhouse gases in both the US and in Nevada (28 percent in the US [EPA 2014a] and 34 percent in Nevada [NDEP 2012a]). The small proportion of this fossil fuel-powered travel that would be impacted by BLM management actions under this RMP makes the contribution of such actions to state, national, and global greenhouse gas levels negligible.

Methane emissions from agricultural activities, including manure management, fertilizer use, and livestock, contribute 10 percent of US (EPA 2014a) and 3 percent of Nevada (NDEP 2012a) greenhouse gas emissions. Therefore, BLM management actions related to livestock grazing in the planning area would also have a negligible impact on state, national, and global greenhouse gas emission levels.

Reasonably Foreseeable Future Action

Mineral and energy development will continue to occur on both federal and nonfederal lands within the planning area. Mineral and energy development result in short-term and long-term emissions of greenhouse gases during fuel combustion in vehicles, drill rigs, and construction equipment. These sources are expected to grow on both federal and nonfederal lands within the planning area. As described in **Section 3.2.2, Climate**, electrical power generation is the largest source of greenhouse gases in both the US and in Nevada (EPA 2014a; NDEP 2012a).

Transportation and its contribution to climate change under any of the RMP alternative would be negligible compared to state, national, and global greenhouse gas levels. However, as the population increases within the planning area, overall vehicle use is expected to increase on both federal and nonfederal lands.

Agricultural use would likely remain stable or decline slightly over the life of the RMP. Because methane emissions from agricultural activities are such a small contribution to greenhouse gases in Nevada, BLM management actions related to livestock grazing in the planning area would result in negligible impacts on state, national, and global greenhouse gas emission levels.

Incremental Cumulative Impact – Combined Past, Present, Reasonably Foreseeable Actions – All Alternatives

Overall, the incremental effects of management actions on greenhouse gas emissions under all alternatives would be small in comparison to greenhouse gas emissions at the state, national, and global levels.

4.3.3 Soil and Water Resources

This section presents potential impacts of the alternatives on soil and water resources within the planning area. Existing conditions concerning soil and water resources are described in **Section 3.2.3, Soil and Water Resources**.

Summary

Proper soil health can affect the implementation of many resource uses, including mineral development, livestock grazing levels, wildlife habitat designations, and recreational uses. Soil resources, including biotic soil crusts, are susceptible to impacts from surface disturbing activities that may result in increased erosion or compaction, especially fragile soil areas.

The primary goals of soil management are to maintain inherent productivity of soil resources and promote sustained yields while keeping erosion at acceptable levels, thus preventing physical or chemical degradation. Proposed surface-disturbing projects will be analyzed to determine suitability of soils to support or sustain such projects and will be designed to minimize soil loss.

Overall, objectives and actions associated with other resources that result in closure of land to surface disturbance activities would benefit soil resources. Management for the following resources would not result in an effect on soil resources: air quality, climate, cultural resources, water resources, paleontological resources, visual resources, caves and cave resources, Back Country Byways, National Trails, WSRs, and Back Country Wildlife Conservation Areas (BCWCAs).

Some of the above resources, such as special designations, may aid in protecting soil resources by reducing the availability of surface disturbing activities.

Under all alternatives, water resources would receive certain levels of protection due to management in accordance with the Clean Water Act and other applicable state and federal water quality standards. Site-specific mitigation and BMPs for surface-disturbing activities would further reduce impacts on water resources. Adhering to these standards would reduce many of the impacts from future actions. In addition, existing and proposed stipulations designed to protect water resources would minimize sediment and contaminant delivery potential by preventing or limiting surface-disturbing activities near sensitive areas, such as hydrologic features, designated municipal watersheds and source water protection areas, and domestic wells. Stipulations and limitations for other resources (e.g., fisheries and riparian) that prevent or limit

surface-disturbing activities would provide additional protection for water resources.

Stipulations designed to protect water resources vary by alternative, as do stipulations for other resources that provide additional protection for water resources.

Alternative actions that allow the least amount of soil disturbance, loss of vegetation, energy and minerals development, recreational use, and roadway/transportation facilities development would be the least impactful on water resources. Also, alternative actions that most overlap management of protected areas (such as ACECs, WSRs eligibility, or suitability interim management) and restoration and revegetation projects would result in the most beneficial cumulative impacts on water resources.

Management for the following resources would not result in an effect on water resources: air quality, climate management, fish and wildlife, special status species, wild horse and burros, cultural resources, paleontological resources, visual resources, caves and cave resources, forestry and woodland products, Back Country Byways, national trails, back country wildlife conservation areas, WSAs, tribal interests, public health and safety, and interpretation and environmental education.

Methods of Analysis

Methods and Assumptions

Soil and water resources baseline information in **Section 3.2.3**, Soil and Water Resources, was reviewed for current understanding of known resources and to determine the condition of the resources. All laws and regulations pertinent to determining effects on soil and water resources (e.g., National Resources Conservation Service's Soil Survey Handbook) were considered and included in criteria for determining impacts. This known information was overlain with the actions found under each alternative in **Chapter 2**, and conclusions were drawn based on an understanding of how these types of actions may affect known and potentially discoverable resources.

The following assumptions were used to assess the impacts on soil and water resources:

- Soils on BLM-administered lands will be managed to maintain inherent productivity and promote sustained yields, while keeping erosional mechanism at minimal/acceptable levels thus preventing physical or chemical degradation. Proposed surface-disturbing projects will be analyzed to determine suitability of soils to support or sustain such projects and will be designed to minimize soil loss.

- Achieving or maintaining Standards for Rangeland Health and Guidelines for Livestock Grazing Management (described in **Section 3.7**, Livestock Grazing/Range Management) are generally effective in managing the effects on soils from livestock grazing. Grazing authorizations will be adjusted on a case-by-case basis when site-specific studies indicate changes in management are needed.
- BLM management actions and objectives will be consistent with soil resource capabilities.
- Fuels projects and planned or unplanned fires that contribute to establishing a more natural fire regime would result in long-term benefits to soil health.
- Roads and trails contribute to soil compaction and erosion. Higher road and trail densities will result in more adverse impacts on soil resources. Roads and trails that receive more traffic will be at greater risk for soil erosion unless they are improved.
- All surface-disturbing activities will include mitigation, standard operating procedures, and BMPs to reduce impacts on soil resources.
- The management actions for each resource were compared to identify differences, which, where they occur, are usually differences of degree.
- The BLM will follow BMPs outlined in **Appendix B**.
- Projects that help restore watersheds, desirable vegetation communities, or wildlife habitats (including surface disturbance associated with these efforts) will benefit soil and water resources over the long term.
- Impacts from surface disturbance activities on water resources will be influenced by several factors, including: location within the watershed, proximity to drainages or existing groundwater wells, time and degree of disturbance, reclamation potential of the affected area, existing vegetation, precipitation, functionality, and mitigating actions applied to the disturbance.
- Impacts on groundwater resources include water development projects such as wells, which could lower groundwater levels depending on groundwater pumping demand and water use priorities (e.g., multiple uses versus wildlife use).
- Transportation facilities will be designed to BLM minimum standards.
- An aquifer with a shallow water table is more susceptible to contamination. Mineral development is the primary activity that could impact shallow groundwater quality and quantity. Locations in

the planning area with depths to groundwater of less than 100 feet or unconfined aquifers are considered the most likely to be impacted by mineral development. Unconfined aquifers or those with water table elevations of 100 feet below ground surface are more vulnerable to leaks and spills of contaminants at the surface. However, groundwater at greater depths is vulnerable to mine dewatering and casing failure in wells.

Indicators

Indicators of impacts on soil and water resources are as follows:

- Declining soil surface health, as expressed through physical or chemical degradation, either with soils unable to support vegetation or soils that are not functioning at potential for a particular ecological site (e.g., vegetation type, diversity, density, and vigor)
- Acres of BLM-administered land protected from or open to surface-disturbing activities
- Acres of invasive plant species that intrude during ground disturbing activities or after instances of fire
- The ability to meet BLM Nevada Standards for Public Land Health
- Vegetation and infiltration
- The inability to meet state and federal water quality standards for surface and ground water
- Changes in water quality that have detrimental effects on downstream aquatic or riparian species
- Alteration of the physical characteristics of streams, springs/seeps/fens, wetlands, riparian areas, and groundwater aquifers that affect the and sustainability of these resources
- Depletion of water supplies

Nature and Type of Effects

Activities that displace or mix soil horizons, compact, or contaminate soils, or that remove vegetation from soils are generally considered to negatively affect soil health. Impacts on soil resources from surface disturbing activities can result from a number of causes, including improper livestock grazing, some allowed forms of recreation, mineral resource activities, and road improvement or construction. The intensity and extent of impacts on soil resources are determined in part by the type and location of the surface-disturbing activities and surface occupancy. The extent of impacts on soil resources can be affected by any applicable stipulations and plans of operation, such as plans and stipulations that address site-specific environmental concerns and require mitigation to stabilize soil, to prevent unnecessary erosion, and to revegetate disturbed surfaces. Land management actions that prohibit surfaces disturbance,

such as areas closed to mineral entry, are more protective of soil resources than land management that allows surface disturbing activities.

Surface-disturbing activities and surface occupancy can impact soil resources by compacting soil. In some cases, soil compaction aids in water retention and, thus, plant establishment and growth. However, too much compaction decreases water infiltration rates and gas exchange rates. Decreased gas exchange rates can cause aeration problems, induce nitrogen and potassium deficiency, and negatively impact root development, which is a key component of soil stabilization. As soil compaction increases, the soil's ability to support vegetation diminishes. This is because the resulting increase in soil strength and change in soil structure (loss of porosity) inhibit root system growth and reduce water infiltration. As vegetative cover, water infiltration, and soil stabilizing crusts are diminished or disrupted, the surface water runoff rates increase, further accelerating rates of soil erosion.

Travel across land by any means can result in vegetation loss, loss of biotic crusts, soil compaction, and soil erosion. Management approaches that designate travel to specified routes can result in more predictable, localized and manageable impacts. Selectively locating travel routes away from areas of sensitive soil conditions can minimize the extent of these effects, ideally limiting them to the footprint of the trail itself.

Recreation on BLM-administered lands may result in vegetation loss, soil compaction, and soil erosion. There are a number of activities that have minimal impacts. The effects of recreation on soil resources are determined by the severity and intensity of the recreation taking place. Areas with large number of visitors and/or mechanized recreation have a greater chance of resulting in some of the detrimental effects than lower impact, lower number recreation areas. Lands and realty management decisions affect where ground-disturbing activities can and cannot occur. Ground-disturbing activities could result in the compaction of soils, the erosion of soils, or vegetation loss, all of which reduce soil stability. In areas with NSO stipulations and managed as ROW exclusion, soil quality would be protected since ground disturbance would be prohibited and soil erosion would be limited to natural processes. In areas managed as ROW avoidance, soil quality would receive some protection since ground disturbance would often be limited. ROW avoidance areas would generally result in lower impacts on soil resources due to more restrictive conditions of use associated with ROW authorization compared to areas not managed as ROW avoidance.

Improper livestock and wild horse and burro management can affect soil resources, especially in wet areas, around springs, and near salt blocks. Wild horses and burros and domesticated livestock often use riparian and wetland areas for water and shade, and may congregate around water developments, which results in compacted soil and trampled nearby vegetation. At

unsustainable levels, grazing from livestock or wild horses can lead to loss of vegetative cover, reduced water infiltration rates and nutrient cycling, decreased plant litter and water quality, and increased bare ground and soil erosion (Manier et al. 2013). Land health evaluations, AMLs, rangeland monitoring studies, and rangeland health standards are used to assess rangeland condition and help to identify where a change in livestock grazing or wild horse and burro management would be beneficial.

Fluid mineral development generally requires both permanent and temporary roads, drilled wells, and associated well pads. In addition, fluid mineral development may require associated pipelines and transmission lines, along with the construction of necessary service roads for these facilities. Local soil health and characteristics within project footprints are typically impacted by compaction and vegetation clearing. Effects or impacts from mineral development is regulated and mitigated through federal and state laws, as well as handbooks, stipulations, and conditions of approval, which can reduce the amount of soil disturbance on a case-by-case basis.

Locatable minerals, mineral materials, and nonenergy leasable mineral activities require road construction and large areas of soil excavation. Local soil health and characteristics within project footprints are typically negatively impacted by excavation, compaction, erosion, and vegetation clearing. Once mineral extraction is complete, restoration and restoring vegetation may return a lower level of soil health over the long term; however, landscapes are often permanently changed as areas of prior soil cover are often permanently altered through such features as open pits.

The BLM would manage soil resources to maintain the natural habitat and to minimize the potential for accelerated wind and water erosion caused by surface disturbing activities. In order to maintain soil processes, a healthy, productive, and diverse plant community is necessary. Vegetation management to improve ecological condition would increase soil productivity, litter, biological soil crust, soil fertility, water infiltration, and nutrient cycling.

Direct and indirect impacts of land uses on soil resources are generally best mitigated by avoiding or minimizing the impacts to the degree practicable with stipulations, such as NSO and CSU. Management actions for the other resources would vary the amount of land available for surface-disturbing activities and those that could impact the soil resources. Activities that would increase erosion would be mitigated by implementing BMPs and standard operating procedures through reclamation or environmental enhancement activities to stabilize or maintain soil processes.

The mandate to manage the land for multiple uses requires the BLM to consider some uses that could degrade water quality, destabilize natural stream morphologic conditions, impair sustainability of water resources, alter

groundwater aquifer properties, and modify natural stream hydrographs. Minimizing such impacts is a common theme in all of the alternatives.

Activities that can potentially cause adverse effects on water resources include: recreation, mineral extraction, grazing, energy production, and other surface disturbing activities. Surface water quality impacts can result from both natural and human factors. Natural factors, such as evaporative concentration in desert environments and volcanic and geothermal sources, are difficult to control. Surface water quality impacts from humans can result from a number of causes, including transport of eroded soils into streams due to livestock grazing, runoff from historic mining sites, introduction of waste matter into streams from domestic livestock, and routes and ways used by motorized vehicles. If hydraulic fracturing resulted in additional oil and gas potential within the planning area water resources may be affected by additional water use and potential methane contamination.

Nonpoint sources can also impact surface water quality within the planning area. These impacts potentially result from transportation corridors (railways and roads), urban runoff and construction-related impacts from land development, recreation developments (official and unofficial), livestock grazing, herbicide use for weed control, and wildland fires.

Natural aquifer properties can be altered by subsurface disturbances such as well construction and water developments, which can increase potential for contamination of surface and groundwater resources along fractures or faults (DOI 2001). For alluvial aquifers located near streams groundwater contamination can be a major and potentially long-term contributor to contamination of surface water (USGS 2014). Surface water supply can be diminished when water that would have otherwise discharged as surface flow is withdrawn from shallow aquifers.

Air quality protections such as using the best air quality control technology, as per guidance from the Bureau of Air Quality Planning and complying with the Clean Air Act, would be applied as needed to meet air quality standards. These standards will help prevent excess particulates from accumulating in the atmosphere and ultimately being deposited into water bodies which will allow these water bodies to continue meeting state and federal standards and allow aquatic and riparian species to thrive.

Under all action alternatives, new water management imperatives associated with climate change may require restoration of natural systems and construction of new infrastructure to reduce flood risks or to capture early run-off. Although erosion could occur from the construction of this new infrastructure, the overall impacts would positively impact our ability to address climate change impacts on water resources, including: increased water temperature, the impact of drought on water resources, and an increased

frequency of severe precipitation events by identifying and filling priority freshwater needs.

The alternatives vary from no action to an emphasis on resource use, an emphasis on conservation, an emphasis on BLM-administered lands within the urban interface area, and an overall mix and variety of management actions. The different alternatives each result in different priorities for resource development. Some of these priorities on resource use would impact soil and water resources more than others. Below is a comparison of the effects from each resource on soil and water resources under Alternatives A, B, C, D, and E.

Soils: Effects from Soil Resources

Effects Common to All Alternatives

Under all alternatives, the BLM would manage soil resource areas with high erosion susceptibility to reduce soil loss from accelerated wind and water erosion by limiting BLM and BLM-authorized activities to no more than a 50 percent reduction in ground cover. Any proposed activities located on sensitive soils would incorporate BMPs and other mitigation measures to minimize soil erosion and maintain soil stability. In addition, areas with severe erosion hazards will be limited to designated roads for OHV use.

Effects under Alternative A

There are no additional management actions for soil resources under Alternative A other than those described under *Effects Common to All Alternatives*.

Effects under Alternative B

Alternative B would manage soil resources to reduce soil loss caused by accelerated erosion due to ground disturbing activities by maintaining and improving vegetation cover in areas of high erosion potential by applying soil amendments or requiring a growth medium. During surface disturbing activities, available topsoil would be stockpiled and reserved for post disturbance reclamation. Additionally, surface disturbing activities on slopes greater than 30 percent would require an erosion control plan that must be approved by the BLM prior to construction and maintenance.

Alternatives B through E would apply a CSU stipulation for fluid mineral leasing on lands with slopes greater than 15 percent and less than 50 percent or on lands with severe wind or water erosion hazard ratings, and an NSO stipulation on slopes greater than 50 percent. These alternatives would be more protective of soils on steep slopes or susceptible to wind or water erosion than Alternative A.

Effects under Alternative C

Alternative C would apply CSU and NSO stipulations for fluid mineral leasing, similar to Alternative B.

Alternative C would manage soil resources by improving vegetation cover by increasing litter, biological soil crusts, and vegetation type based on soil type. Alternative C would also minimize the break up or shearing of biological soil crusts during vegetation management.

Alternative C would manage soil resources during surface disturbing activities by stockpiling available topsoil or the best available material for growth medium for post-disturbance reclamation. Alternative C would further manage the stockpiled medium by requiring that mulch be applied to the medium if reclamation is not complete within 1 year, and must be seeded to prevent sediment loss if reclamation is not completed within 2 years. This would prevent erosion of the stockpiled topsoil or best growth medium during interim phases of development more than Alternative A.

Alternative C would require an erosion control plan for slopes between 21 percent and 39 percent, which must be approved by the BLM prior to construction and maintenance. Alternative C would prohibit surface disturbing activities on slopes greater than 40 percent, and may allow for placement alternatives if the action would not cause undue or unnecessary degradation on slopes lower than 40 percent, with an erosion control plan in place.

Effects under Alternative D

Alternative D would manage soil resources by utilizing deep-rooted stabilizing native and no-native vegetation to improve and stabilize the soil surface.

Alternative D would also manage soil resources during surface disturbing activities, require erosion control plans, and limit or prohibit surface disturbing activities.

Effects under Alternative E

Management actions for soil resources under Alternative E would be the same as those described under Alternative D.

Soils: Effects from Vegetation Resources

Effects Common to All Alternatives

Small-scale rangeland activities, including livestock impoundments, vegetation mowing, and seed collection, with less than one acre of surface disturbance, involve short-term increases in erosion and soil compaction. Due to the small size of the areas, these activities would result in negligible impacts on soil resources.

Vegetation management would initially disturb soils by removing undesirable vegetation through cutting or burning, planting native seed, and occasionally using heavy equipment. Success of vegetation management may not result in soil health improvements for years after initial disturbance. Soils that have a high restoration potential value would tend to support restorative vegetation

activities due to proper soil conditions, such as low salt content, adequate water retention, and available rooting depth. High potential restoration soil must combine with favorable environmental conditions such as precipitation and temperatures to be successful. If success is not obtained then reintroducing plantings or seeding must reoccur for success to occur.

Vegetation: Rangelands

Maintaining and restoring vegetation cover on rangelands would protect soils from erosion and increased wildland fire. Measures to rest land, restrict grazing, fence sensitive areas, and disperse impacts from riparian areas would also protect and restore soil resources. Rangeland vegetation management would be implemented under all alternatives with varying methods to achieve goals. Specifically, management actions vary in the type of vegetation (native, non-native, deep-rooting, those with high establishment rates) used in revegetation efforts, the priority of vegetative treatment sites, methods used to improve the health and diversity of vegetation on the range, and implementation of vegetation treatment objectives. All of these management actions would ultimately improve vegetation resources, which in turn would benefit soil resources through stabilization, reduction in potential for erosion by wind, and slowing runoff during heavy or flash rain events. This would reduce erosion by water. The rate of restoration under each alternative is not quantifiable, nor is the resulting vigor or health of the range as a result of the varying management actions. The effect of rangeland management on soil resources is essentially common to all alternatives.

Vegetation: Riparian Areas

Appropriate management of riparian areas would help reduce accelerated erosion and deposition of sediments directly related to the health and function of wetland soils. Restrictive buffers around streams and water bodies and closures to prevent actions that would degrade riparian conditions would indirectly protect soil resources within these areas. This effect would be localized and similar under all alternatives, except that its degree would depend on the degree of functionality reached within riparian areas.

Vegetation: Invasive, Nonnative Species, and Noxious Weeds

All of the alternatives provide for some sort of weed management. This would improve vegetation diversity and cover, reducing erosion potential and improving soil stability.

Effects under Alternative A

Alternative A would not provide additional management actions for vegetation restoration and rehabilitation or invasive, nonnative species or noxious weed reduction. Outdated or insufficient management actions may not result in the desired effects of reduction in invasive weeds and would make more areas vulnerable to invasive species establishment and spread.

Effects under Alternative B

Vegetation: Restoration and Rehabilitation

Under Alternatives B through E, rehabilitation projects would be conducted to stabilize soils, promote plant resiliency, limit expansion or dominance of invasive species, and reestablish native species. Implementing post-fire ESR treatments would differ by alternative in the number and location of acres treated. Projects aimed at rehabilitating the landscape after a fire event will have a beneficial effect on soil resources by stabilizing soils, reducing runoff, and preventing wind erosion until vegetation composition can be restored.

Vegetation: Invasive, Nonnative Species, and Noxious Weeds

Alternative B would utilize appropriate mechanical, biological, and chemical control methods to eradicate or control invasive, nonnative species, and noxious weeds. These control methods could be used alone or in combination, and may require multiple applications to achieve goals. Control methods for the reduction of weeds would result in short-term impacts on soil resources from compaction or ripping by heavy machinery, introduction of herbicides, or heavy grazing methods to remove unwanted vegetation within treatment areas. These areas would eventually benefit from such vegetation treatments to restore native species.

Alternative B would also minimize the spread of noxious weeds through the control of materials contaminated with noxious plant seeds or parts by requiring salable mineral materials obtained from BLM-administered land to have a Weed Free certification from the Nevada Department of Agriculture, and that construction on BLM-administered land utilize earth materials certified as Weed Free by State of Nevada and State of California. Also, renewal and amendment request for land use authorizations would require a stipulation in the authorization addressing noxious weed management. These additional management actions would inadvertently protect soil resources from the spread of noxious weeds.

Effects under Alternative C

Vegetation: Restoration and Rehabilitation

Effects on soil resources from Vegetation: Restoration and Rehabilitation under Alternative C would be the same as those described under Alternative B.

Vegetation: Invasive, Nonnative Species, and Noxious Weeds

Alternative C would eliminate the use chemical controls to treat invasive plants. Fewer acres would be treated, leaving soils in areas subject to increased erosion potential and subject to higher fire return cycles as invasive plants would likely prevail in untreated areas. Alternative C would utilize appropriate mechanical and biological control methods to eradicate or control invasive, nonnative species and noxious weeds. These control methods could be used alone or in combination and may require multiple applications to achieve goals. Chemical

control methods would not be used. This would eliminate the introduction of herbicides to soil resources.

Alternative C would also minimize the spread of noxious weeds through the same control of materials methods discussed under Alternative B.

Effects under Alternative D

Vegetation: Restoration and Rehabilitation

Effects on soil resources from Vegetation: Restoration and Rehabilitation under Alternative D would be the same as those described under Alternative B.

Vegetation: Invasive, Nonnative Species, and Noxious Weeds

Management of noxious weeds under Alternative D would be the same as those described under Alternative B.

Effects under Alternative E

Vegetation: Restoration and Rehabilitation

Effects on soil resources from Vegetation: Restoration and Rehabilitation under Alternative E would be the same as those described under Alternative B.

Vegetation: Invasive, Nonnative Species, and Noxious Weeds

Management of noxious weeds under Alternative E would be the same as those described under Alternative B.

Soils: Effects from Fish and Wildlife Management

Effects Common to All Alternatives

Small-scale activities, including wildlife water development with less than 1 acre of surface disturbance, involve short-term increases in erosion and soil compaction. Due to the small size of the areas, these activities would result in negligible impacts on soil resources.

Improvements to land health and aquatic habitat, restrictions on access, and stream bank alterations could increase soil stability, provide vegetative cover, and reduce ground disturbance, thereby improving the health of soil resources. Implementation of mitigation measures and applying Land Health Standards, BMPs and standard operating procedures to maintain or improve wildlife habitat would also maintain or improve soils. Restriction of land use as a result of wildlife management would reduce the potential for impacts on soil resources in those areas.

Effects under Alternative A

Management of fish and wildlife under Alternative A would not provide for any additional land use restrictions that would reduce the possibility of impacts on soil resources. Current restrictions and protections for habitat and species that

indirectly protect soil resources would continue, but there would be fewer specific measures and objectives than the other alternatives. This would result in less protection of soil resources under Alternative A than the other alternatives.

Effects under Alternative B

Surface use restrictions under Alternative B as a result of fish and wildlife management would be greater than Alternative A.

Wildlife Habitat

Alternative B would restrict surface use by implementing CSU stipulations for fluid mineral leasing within 500 feet of lentic and lotic habitats and managing a 100-foot ROW avoidance buffer for fish and wildlife priority habitat.

Migratory Birds

Important Bird Area and migratory pathway management would apply CSU stipulations for fluid mineral leasing in these areas and manage these sites as ROW avoidance areas.

Raptors

Raptor habitat management would apply CSU stipulations within 0.25 miles of active nest sites, and would manage these sites as ROW avoidance areas.

Bat Habitat

Alternative B would not implement surface restriction as a result of bat habitat management.

Greater Sage-Grouse

Greater Sage-Grouse habitat management would manage PPMA (275,600 acres) with CSU stipulations for fluid mineral leasing, and as ROW avoidance areas.

Effects under Alternative C

Restriction of surface use under Alternative C would be the greatest of all the alternatives.

Wildlife Habitat

Under Alternative C, wildlife habitat management would apply NSO stipulations for fluid mineral leasing within 500 feet of lentic and lotic habitats, would manage fish and wildlife habitat as ROW exclusion areas with a 500-foot buffer, and would close these areas to mineral material disposal and nonenergy mineral leasing. Surface use restrictions as a result of wildlife habitat management would be greater under Alternative C than Alternative A, and would therefore result in greater protections of wildlife habitat.

Migratory Birds

Alternative C would manage Important Bird Areas and migratory pathways as ROW exclusion areas. The BLM would also apply NSO stipulations for fluid

mineral leasing and close these areas to mineral material disposal. This would be more restrictive of surface disturbing activities than Alternative A.

Bat Habitat

Alternative C would prohibit large-scale surface-disturbing discretionary actions within 500 feet of bat occupied caves. This would reduce the possibility of impacts on soil resources around these caves.

Raptors

Raptor management would include applying NSO stipulations to fluid mineral leasing within 0.5 mile of active nest sites, managing raptor nest sites as ROW exclusion areas, and closing these sites to mineral material disposal and nonenergy mineral leasing.

Effects under Alternative D

Surface use restriction under Alternative D would be similar to surface use restriction described under Alternative B. However, Alternative D would provide surface use restriction under bat habitat management, whereas Alternative B would not.

Wildlife Habitat

Under Alternative D, wildlife habitat management would be the same as described under Alternative B.

Migratory Birds

Under Alternative D, Important Bird Area management would be the same as described under Alternative B.

Bat Habitat

Alternative D would prohibit large-scale surface-disturbing discretionary actions within 200 feet of bat occupied caves. This would reduce the possibility of impacts soil resources around the caves.

Raptors

Under Alternative D, raptor habitat management would be the same as described under Alternative B.

Effects under Alternative E

Surface restrictions as a result of fish and wildlife management under Alternative E would be greater than under Alternative A.

Wildlife Habitat

Wildlife habitat management under Alternative E would apply NSO stipulations within 500 feet of lentic and lotic habitat with some exceptions, modifications, and waivers, and would manage fish and wildlife priority habitat is ROW avoidance areas with a 100-foot buffer.

Migratory Birds

Under Alternative E, Important Bird Area management would be the same as described under Alternative B.

Bat Habitat

Alternative E would prohibit large-scale surface-disturbing discretionary actions within 0.5 mile of bat occupied caves and within 0.25 mile of caves not known to be occupied by bats.

Raptors

Under Alternative E, raptor habitat management would be the same as described under Alternative C.

Soils: Effects from Special Status Species Management

Effects Common to All Alternatives

Measures to protect special status fish, wildlife, and wildlife habitat include a variety of restrictions, buffers, closures, height limits, and bat gates that would limit activities incompatible with maintaining special status species. These actions could indirectly reduce the potential for disturbance of soil resources, or improve soil resources through habitat management or improvement.

Effects under Alternative A

Management of special status species under Alternative A would not provide for any additional land use restrictions that would reduce the possibility of impacts on soil resources.

Effects under Alternative B

Greater Sage-Grouse

Greater Sage-Grouse habitat management would manage PPMA (275,600 acres) with CSU stipulations for fluid mineral leasing and as ROW avoidance areas.

Effects under Alternative C

Greater Sage-Grouse

Alternative C would close PPMA and PGMA (414,200 acres) to fluid mineral leasing, nonenergy mineral leasing, and mineral material disposal. In addition, the BLM would manage these areas as ROW exclusion areas. Alternative C would implement the most restrictions on Greater Sage-Grouse habitat, and would, therefore, be the most protective of soil resources within these areas.

Effects under Alternative D

Greater Sage-Grouse

Under Alternative D, Greater Sage-Grouse habitat management would apply NSO stipulations for fluid mineral leasing within PPMA (275,600 acres) with no

exceptions, modifications, or waivers. Alternative D would apply NSO stipulations for fluid mineral leasing within PGMA (138,600 acres) with exceptions, modifications, and waivers as outlined in **Appendix C**, and would manage PPMA and PGMA as ROW avoidance areas (414,200 acres). These restrictions are greater than Alternative A.

Effects under Alternative E

Greater Sage-Grouse

Alternative E would manage PPMA and PGMA as closed to nonenergy mineral leasing and mineral material disposal. Alternative E would be more protective of soil resources than Alternative A.

Soils: Effects from Wild Horse and Burro Management

Effects Common to All Alternatives

Direct impacts associated with wild horse and burro gathers would consist of disturbance to soil surfaces immediately in and around the temporary gather sites and holding facilities. Impacts would be created by vehicle traffic and hoof action as a result of concentrating horses and burros, and could be locally high in the immediate vicinity of the gather sites and holding facilities. Generally, these sites would be small (less than 0.5 acre) in size. Any impacts would remain site-specific and isolated in nature. Impacts would be considered minimal as gathering and herding would be of short duration.

Normally, these gather sites are located near or on roads, pullouts, water haul sites or other flat areas, which have been previously disturbed, to enable easy access by transportation vehicles and logistical support equipment. These common practices would minimize the potential impacts on soils.

Indirect impacts from reduced concentrations of wild horses and burros would be reduced soil erosion and compaction. This reduction in soil erosion and compaction would be most notable and important in the vicinity of small springs and meadows currently experiencing high levels of disturbance and bare ground from the excess wild horses and burros.

As wild horse and burro populations increase over time, and if they exceed upper AML level, soil loss from wind and water erosion, and invasion of undesired plant species would continue or expand as a result of over-utilization of vegetation, loss of perennial native grasses and heavy trailing due to an over-population of wild horses within the HMA. This loss would be most notable in the vicinity of small springs and meadows and other water sources with high levels of wild horse and burro use.

Under all alternatives, the BLM would manage wild horses and burros within HMAs with goals to maintain adequate habitat, forage, and water to support healthy populations at identified AMLs. When wild horse and burro populations

exceed the upper AML level, gathers would be conducted to remove the excess animals and reduce the population to the lower AML level. Impacts under each alternative with respect to soil resources would be the same.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Soils: Effects from Wildland Fire Ecology and Management

Effects Common to All Alternatives

Wildland fire reduces plant cover, litter, and biological soil crust. This results in soil resources that are highly susceptible to erosion. ESR and burned area rehabilitation treatments may be implemented to reduce these impacts. Wildland fire increases wind erosion, which may be a minor to a substantial impact on public health depending on fire location, especially among sensitive groups, such as children, the elderly, or those individuals with asthma or emphysema. Wildland fire also increases water erosion, which may be either a minor or greater impact depending on slope stability and risk of landslide within recently burned areas.

Impacts from erosion are greatest during the first year after the fire, and diminish over time as vegetation is reestablished. Water erosion can be substantial within limited areas, especially if the sediment impacts residential or industrial areas and transportation systems. These impacts would occur until vegetation becomes fully established.

Fire impacts would also include the reduction of soil nutrients from wind and water erosion, loss of shrubs or deep-rooted plants, reduced nutrient cycling and organic matter, loss of biological crusts, reduced vegetation productivity, and increased compaction from loss of surface litter.

Initiation of ESR actions would ensure timely stabilization of watersheds, reduction of flood hazards, and replacement or reestablishment of vegetation through seeding and recovery of perennial plants. The reestablishment of vegetation cover, litter, and viable root mass would reduce the impacts of wind

and water erosion on soil resources. Stabilization of watersheds would prevent undue loss of topsoil, reducing loss of site potential. Short-term increases in water and wind erosion are unavoidable in the first year following a wildfire.

Effects under Alternative A

Under Alternative A, the CCD is divided into 4 fire management categories. Category A would manage 21,000 acres with aggressive and full fire suppression, and would aim to keep fires to less than 10 acres. Category B would manage 467,000 acres to suppress and control fires to less than 10 acres in forested areas, and less than 25 acres in brush or grass areas. Category C would manage 1,119,100 acres to contain unplanned ignitions to less than 2,000 acres in all vegetation types, and fire suppression tactics would be constrained to protect scenic, natural resources, and wilderness values. Category D would manage 3,104,900 acres to contain fires by appropriate means when conditions will result in significant damage to natural resources or threaten private developments.

Efforts to suppress fires to certain acreage may increase impacts on soils from fire suppression activities but would result in fewer impacts on soil resources from wildland fire, as described under *Effects Common to All Alternatives*.

Effects under Alternative B

Under Alternative B, a full range of fire management activities and options would be utilized to protect all identified values at risk, as identified in the regularly updated fire management plan for the district. Fire suppression activities would reduce the potential impacts on soil resources from wildland fires, but may increase their risk of impact from fire suppression tools and equipment.

After a fire has occurred, Alternatives B through E would implement ESR to stabilize soils, re-establish hydrologic function, maintain and enhance biological integrity, promote plant resiliency, limit expansion or dominance of invasive species, and reestablish native species. This would reduce the overall impacts on soil resources from wind and water erosion after a fire event.

Effects under Alternative C

Under Alternative C, minimum impact suppression would be applied so that emergency fire management methods would be no greater than necessary to meet fire management objectives. Alternative C would allow the use of dozers for fire management only when there is a threat to public safety or property damage, and chemical agents would not be allowed for suppression activities. These limits to suppression activities could put soil resources at greater risk of impact from wildland fire, but at less of a risk for impact from fire suppression activities.

Under Alternative C, hazardous fuels reduction projects would be implemented where negative impacts of wildland fire are greatest on sensitive cultural

resources, and sensitive biological and other natural resources. This would reduce the overall possibility of impacts on soil resources from wildland fire in these areas.

Alternative C would implement ESR as described under Alternative B.

Effects under Alternative D

Like Alternative B, Alternative D would implement a full range of fire management activities and options would be utilized to protect all identified values at risk, as identified in the regularly updated fire management plan for the district.

Alternative D would implement ESR as described under Alternative B.

Effects under Alternative E

Under Alternative E, the BLM would implement a full range of fire management activities and options to protect all values at risk and to sustain healthy ecosystems within acceptable risk levels. This would include protecting WUI, cultural, paleontological, and biological and other natural resources from catastrophic impacts of wildfire and wildfire suppression activities.

Under Alternative E, hazardous fuels reduction projects would be implemented where impacts from wildland fire are greatest on public health and safety and sensitive biological, cultural, and other natural resources are greatest.

Alternative E would implement ESR as described under Alternative B.

Soils: Effects from Livestock Grazing Management

Effects Common to All Alternatives

All alternatives would comply with the Approved Standards and Guidelines for livestock grazing, would manage all allotments with the goal of meeting rangeland health, and would rest areas burned by prescribed or wildland fire for a minimum of two growing seasons before resuming livestock grazing actions. This would reduce the potential for soil resources to become trampled and compacted or susceptible to wind or water erosion due to loss of vegetation cover from overgrazing.

Small-scale activities, including livestock impoundments, vegetation mowing, and seed collection, with less than one acre of surface disturbance, involve short-term increases in erosion and soil compaction. Due to the small size of the areas, these activities would result in negligible impacts on soil resources.

Effects under Alternative A

Alternative A would manage livestock grazing without the option to make unavailable allotments where ecological function continues to decline due to grazing after management changes have been implemented.

Under Alternative A, 6,700 acres would continue to be managed as unavailable for livestock grazing. This would continue to protect these areas from impacts on soil from livestock grazing, such as soil compaction.

Effects under Alternative B

Alternative B would make unavailable allotments where management changes have been implemented but ecological function is still decreasing due to grazing. The resultant vacant allotments could be offered for application to a new permittee.

Under Alternative B, the BLM would manage 6,100 acres as unavailable to livestock grazing. This would provide slightly more acres available for livestock grazing than Alternative A.

Effects under Alternative C

Alternative C would make allotments unavailable as they become vacant. This would result in an overall decrease in livestock grazing on the landscape through the life of the RMP. This would reduce effects from livestock grazing on soil resources but would also remove any range management and improvement features which may be improving soil stability and health.

Under Alternative C, 2,702,000 acres would be managed as unavailable to livestock grazing, which is more than the other alternatives.

Alternative C would provide for an emergency shutdown option to make all allotments unavailable to livestock grazing during emergency situations such as drought, fire, or a plague of insects. This would reduce the overall effect of these emergency situations on vegetation and soil resources.

Effects under Alternative D

Alternative D would make unavailable allotments where management changes have been implemented but ecological function is still decreasing due to grazing, or if livestock grazing is incompatible with urban uses.

Alternative D would manage 10,700 acres as unavailable to livestock grazing, which is greater than under Alternative A.

Alternative D would provide for an emergency shutdown option to make all allotments unavailable for livestock grazing during emergency situations such as drought, fire, or a plague of insects. This would reduce the overall effect of these emergency situations on vegetation and soil resources.

Effects under Alternative E

Alternative E would make unavailable allotments where management changes have been implemented but ecological function is still decreasing or failing to reach other defined objectives due to livestock. Allotment boundaries would be modified to address incompatible urban uses. This would reduce the

compounding impacts from urban and grazing use on soil resources in these areas.

Under Alternative E, the BLM would manage the same number of acres as unavailable to livestock grazing as Alternative B.

Alternative E would provide for an emergency shutdown option to make all allotments unavailable to livestock grazing during emergency situations such as drought, fire, or a plague of insects. This would reduce the overall effect of these emergency situations on vegetation and soil resources.

Soils: Effects from Geology and Mineral Management

Effects Common to All Alternatives

Construction activities that involve geothermal, oil and gas, and mine development, mineral material pits and power plants would remove vegetation, thereby increasing erosion and soil compaction in the short term. Erosion would involve impacts from negligible to greater, depending on the level of disturbance and the soil type. Long-term mitigations and reclamation are common to all alternatives. With reclamation and mitigation, impacts would be minor. Differences among types and degree of reclamation and mitigations are discussed below.

Under all alternatives, 194,900 acres would be managed as closed to locatable mineral entry.

Effects under Alternative A

Locatable Minerals

Alternative A would maintain withdrawal of 194,900 acres of federal mineral estate from locatable mineral entry. Alternative A would also replace pre-FLPMA Classification and Multiple Use Act segregations with FLPMA withdrawals. This would result in withdrawing 5,500 acres of currently segregated lands from locatable mineral entry. This would indirectly protect soil resources from impacts of locatable mineral exploration and development in these areas.

Fluid Minerals

Alternative A would continue to manage 839,100 acres as closed to oil and gas and geothermal leasing. The BLM would manage an additional 700 acres with NSO stipulations for oil and gas leasing, including areas within 300 to 500 feet of water resources, and around important archaeological sites.

Mineral Materials (Salable)

Alternative A would manage 564,200 acres as closed to mineral material disposal.

Nonenergy Leasable Minerals

Alternative A would close 738,800 acres to nonenergy leasable minerals.

Effects under Alternative B

Locatable Minerals

Alternative B would recommend 439,600 acres for withdrawal from locatable mineral entry. This would be more than Alternatives A.

Fluid Minerals

Alternative B would manage 768,500 acres as closed to oil and gas and geothermal leasing. The BLM would apply NSO stipulations on fluid mineral leasing on an additional 404,600 acres within ACECs and areas with slopes greater than 50 percent. The BLM would apply CSU stipulations on fluid mineral leasing on 2,120,200 acres, including PPMA, some ACECs, NRHP-listed properties, within 500 feet of Dynamite and Hidden Caves or lentic and lotic habitats, additional lands with slopes greater than 50 percent, lands with severe soil, wind, or water erosion, within Important Bird Areas, and within 0.25 mile of raptor nests.

Mineral Materials (Salable)

Alternative B would manage 807,200 acres as closed to mineral material disposal, including Hidden and Dynamite Caves, WSAs, and within 300 feet of known human burials. Alternative B would restrict mineral material disposal within PPMA and PGMA if it is determined that there would be adverse impacts on Greater Sage-Grouse or their habitat. This could result in restrictions for mineral material development on 414,200 acres.

Assuming that PPMA and PGMA remain open or that mineral material disposal could be mitigated to not adversely affect Greater Sage-Grouse habitat, Alternative B would manage the fewest acres with restrictions on mineral materials of the alternatives.

Nonenergy Leasable Minerals:

Alternative B would manage 981,900 acres as closed to nonenergy leasable minerals, including WSAs, areas within 300 feet of known human burials, and Washoe County. Alternative B would restrict nonenergy leasable mineral development within Greater Sage-Grouse PPMA and PGMA if it is determined that there would be adverse impacts on Greater Sage-Grouse or their habitat.

Assuming that PPMA and PGMA remain open or that nonenergy leasable mineral development could be mitigated to not adversely affect Greater Sage-Grouse habitat, Alternative B provides for the same amount of acres of closure to nonenergy leasable minerals than under Alternative A, but less than under Alternatives C, D, and E.

Effects under Alternative C

Locatable Minerals

Under Alternative C, 117,500 acres would be recommended for withdrawal from locatable mineral entry, which is greater than Alternative A.

Fluid Minerals

Alternative C would manage 2,081,700 acres as closed to oil and gas and geothermal leasing. The BLM would apply NSO stipulations for fluid mineral leasing on an additional 1,039,200 acres. These areas include lands with slopes greater than 50 percent, priority watersheds containing municipal water supplies, areas within 500 feet of riparian and wetland areas, lentic and lotic habitats, Important Bird Areas, within 0.5 mile of active raptor nests, NRHP-listed properties, ACECs, the East Fork Carson River Segment I, and BCWCAs. The BLM would manage 1,242,800 acres with CSU stipulations including lands with slopes greater than 15 percent and less than 50 percent, and lands with severe soil, wind, or water erosion hazard ratings.

Mineral Materials (Salable)

The BLM would manage 3,004,800 acres as closed to mineral material disposal. This includes caves and cave resources, priority watersheds containing municipal water supplies, within 200 feet of riparian and wetland areas, fish and wildlife priority habitats, within 0.5 mile of active raptor nests, PPMA and PGMA, some ACECs, within 2.5 miles of National Historic Trail (NHT) corridors, the East Fork Carson River Segment, within 1 mile of known human burials, the Virginia Range ERMA and BCWCAs.

Alternative C would close substantially more acres to mineral materials than Alternative A (564,200 acres closed).

Nonenergy Leasable Minerals:

Alternative C would close 2,960,800 acres to nonenergy mineral leasing, including priority watersheds containing municipal water supplies, fish and wildlife priority habitats, areas within 0.5 mile of active raptor nests, PPMA and PGMA, some ACECs, within 2.5 miles of NHT corridors, WSAs, within 0.25 mile of the East Fork Carson River Segment I (0.25 mile), within 1 mile of known human burials, Washoe County, and BCWCAs.

Effects under Alternative D

Locatable Minerals

Under Alternative D, 440,800 acres would be recommended for withdrawal from locatable mineral entry, which is greater than Alternative A.

Fluid Minerals

Alternative D would manage 737,000 acres as closed to oil and gas and geothermal leasing. The BLM would apply NSO stipulations on fluid mineral

leasing additional 864,800 acres. This includes the Pah Rah ACEC, lands with slopes greater than 50 percent, within 1,000 feet of municipal well heads in priority watersheds, PPMA and PGMA, the WSR East Fork Carson River Segment I. Also, CSU stipulations would be applied to 2,071,400 acres including areas within 200 feet of riparian and wetland areas, within 500 feet of lentic and lotic habitat, lands with slopes greater than 15 percent and less than 50 percent, lands with severe soil, wind or water erosion hazard ratings, Important Bird Areas, NRHP-listed properties, and some ACECs.

Mineral Materials (Salable)

Alternative D would manage 807,700 acres as closed to mineral material sales, including caves and cave resources, within 1,000 feet of municipal well heads in priority watersheds, some ACECs, WSAs, the East Fork Carson River Segment I, and within 0.25 mile of known human burials. Alternative D would restrict nonenergy mineral material disposal within Greater Sage-Grouse PPMA and PGMA if it is determined that there would be adverse impacts on Greater-Sage Grouse or their habitat. This could result in restrictions for mineral material development on 414,200 acres (PPMA and PGMA).

Assuming that PPMA and PGMA remain open or that mineral material disposal could be mitigated to not adversely affect Greater Sage-Grouse habitat, Alternative D would manage more acres as closed to mineral material sales than under Alternative A.

Nonenergy Leasable Minerals

Alternative D would close 981,900 acres to nonenergy leasable minerals, including areas within 1,000 feet of municipal wellheads, the Virginia Range Combleaf Botanical ACEC, WSAs, within 0.25 mile of the East Fork Carson River Segment, within 300 feet of known human burial, and Washoe County.

Alternative D would restrict nonenergy leasable mineral development within PPMA and PGMA if it is determined that there would be adverse impacts on Greater Sage-Grouse or their habitat.

Assuming that PPMA and PGMA remain open or that nonenergy leasable minerals could be mitigated to not adversely affect Greater Sage-Grouse habitat, Alternative D would manage more acres as closed to nonenergy leasable minerals than under Alternative A.

Effects under Alternative E

Locatable Minerals

Under Alternative E, 470,600 acres would be recommended for withdrawal from locatable mineral entry.

Fluid Minerals

Alternative E would manage 1,007,200 acres as closed to oil and gas and geothermal leasing. The BLM would apply NSO stipulations on additional 1,151,600 acres, including lands with slopes greater than 50 percent, within 1,000 feet of municipal well heads in priority watersheds, areas within 500 feet of riparian/wetland areas and lentic and lotic habitats, within 0.5 mile of raptor nests, within Greater-Sage Grouse PPMA and PGMA, NRHP-listed properties, and the WSR East Fork Carson River Segment I. Alternative E would also manage an additional 1,844,900 acres with CSU stipulations, including lands with slopes greater than 15 percent and less than 50 percent, lands with severe soil, wind or water erosion hazard ratings, and Important Bird Areas.

Mineral Materials (Salable)

Alternative E would manage 1,778,700 acres as closed to mineral material disposal, including caves and cave resources, within 1,000 feet of municipal wellheads in priority watersheds, fish and wildlife priority habitat areas, within 0.5 mile of active raptor nests, within Greater Sage-Grouse PPMA and PGMA, the Ruhenstroth Paleontological ACEC, within 1 mile of high potential historic sites and high potential route segments along NHT corridors, WSAs, the East Fork Carson River Segment I, within 300 feet of known human burials, and the Virginia Range ERMA. Alternative E would close more acreage to mineral materials than under Alternative A.

Nonenergy Leasable Minerals:

Alternative E would manage 1,785,900 acres as closed to nonenergy leasable minerals, including areas within 1,000 feet of municipal wellheads, within 0.5 mile of active raptor nests, the Sand Mountain SRMA, the Ruhenstroth Paleontological ACEC, within 1 mile of high potential historic sites and high potential route segments along NHT corridors, WSAs, within 0.25 mile of the East Fork Carson River Segment, and within 300 feet of known human burial, and Washoe County.

Alternative E would close more acres to nonenergy leasable minerals than under Alternatives A, B, and D, but less than under Alternative C.

Soils: Effects from Recreation and Visitor Services

Effects Common to All Alternatives

SRMAs and ERMAs are BLM-administered land units that provide specific structured recreational activities, experience, and benefit opportunities. Increased use in SRMAs or ERMAs could affect soils by associated increases in vehicle and pedestrian traffic and the resulting compaction and erosion. However, impacts would be reduced through specific management actions outlined for these areas. Mitigations, including limits to new roads, vehicle access, trails, and activities, would be considered to limit impacts on resources. There would be impacts on soil from recreation under all of the alternatives.

Effects under Alternative A

SRMAs

Alternative A would continue to manage two SRMAs. These are the Alpine Indian Creek/East Fork Carson River SRMA (7,600 acres), and the Walker Lake SRMA (60,100 acres). In total, Alternative A would manage 67,700 acres as SRMAs. Alternative A would manage the fewest SRMAs.

ERMAs

Alternative A would not designate any ERMAs.

Effects under Alternative B

SRMAs

Alternative B would designate 6 areas as SRMAs, totaling 76,100 acres: Alpine (5,800 acres), Dead Camel Mountain (16,800 acres), Hungry Valley (21,600 acres), Sand Mountain (7,400 acres), Walker Lake (24,000 acres), and Wilson Canyon (500 acres). Alternative B would designate more SRMAs than Alternative A.

ERMAs

Alternative B would designate 8 ERMAs, totaling 1,678,300 acres: Middlegate (268,700 acres), Mina (824,700 acres), Mustang (400 acres), Pah Rah (20,000 acres), Pine Nut (201,100 acres), Reno Urban Interface (70,600 acres), Salt Wells (292,700 acres), and 102 Ranch (120 acres). Alternative B would designate more ERMAs than Alternative A.

Effects under Alternative C

SRMAs

Alternative C would designate 3 SRMAs, totaling 74,700 acres: Alpine (10,700 acres), Sand Mountain (3,900 acres), and Walker Lake (60,100 acres). Alternative C would designate the same number of SRMAs as Alternative A.

ERMAs

Alternative C would designate 15 ERMAs, totaling 1,528,800: Bagley Valley (2,600 acres), Dry Valley (84,100 Acres), Faye-Luther (40 acres), Middlegate (195,300 acres), Mina (486,400 acres), Mustang (400 acres), Pah Rah (20,000 acres), Peterson (42,200 acres) Pine Nut (201,100 acres), Reno Urban Interface (91,000 acres), Salt Wells (113,700 acres), Singatse (174,900 acres), Virginia Mountains (68,100 acres), Virginia Range (48,800 acres), and 102 Ranch (120 acres). Alternative C would designate more ERMAs than Alternatives A.

Effects under Alternative D

SRMAs

Alternative D would designate 4 SRMAs, totaling 67,100 acres: Alpine (7,400 acres), Dead Camel Mountain (37,400 acres), Hungry Valley (21,800 acres), and Wilson Canyon (500 acres). Alternative D would designate more SRMAs than Alternative A.

ERMAs

Alternative D would designate 6 ERMAs, totaling 292,600 acres: Faye-Luther (600 acres), Mustang (400 acres), Pah Rah (20,000 acres), Pine Nut (201,100 acres), Reno Urban Interface (70,400 acres), and 102 Ranch (120 acres). Alternative D would designate more ERMAs than Alternative A.

Effects under Alternative E

SRMAs

Alternative E would designate 6 SRMAs, totaling 106,100 acres: Alpine (7,700 acres), Dead Camel Mountain (37,400 acres), Hungry Valley (16,200 acres), Sand Mountain (19,700 acres), Walker Lake (24,600 acres), and Wilson Canyon (500 acres). Alternative E would designate the same number of SRMAs as Alternative B and more than Alternatives A.

ERMAs

Alternative E would designate 15 ERMAs, totaling 2,085,800 acres: Bagley Valley (2,600 acres), Dry Valley (83,000 acres), Faye-Luther (110 acres), Middlegate (268,700 acres), Mina (824,700 acres), Mustang (400 acres), Pah Rah (20,000 acres), Petersen (42,000 acres), Pine Nut (201,000 acres), Reno Urban Interface (70,600 acres), Salt Wells (280,400 acres), Singatse (174,900 acres), Virginia Mountains (68,100 acres), Virginia Range (48,800 acres), and 102 Ranch (120 acres). Alternative E would designate the same number of ERMAs as Alternative C, and more than Alternatives A.

Soils: Effects from Comprehensive Travel and Transportation Management

Travel across land by any means can result in vegetation loss, loss of biotic crusts, soil compaction, and soil erosion. Management approaches that designate travel to specified routes can result in more predictable, localized, and manageable impacts. Selectively locating travel routes away from areas of sensitive soil conditions can minimize the extent of these effects, ideally limiting them to the footprint of the trail itself.

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would manage 3,840,300 acres as open to cross-country travel, 31,800 acres as closed to motorized and mechanized travel, 6,900 acres as closed to motorized travel with mechanized travel limited to existing routes, and 924,300 acres as limited to existing roads for motorized travel for a total of 963,000 acres of restrictions.

Alternative A would manage the fewest acres with restrictions for travel management of all the alternatives.

Effects under Alternative B

Alternative B would manage 95,300 acres as open to cross-country travel, 26,700 acres as closed to motorized and mechanized travel, and 4,300 acres as closed to motorized travel with mechanized travel limited to existing routes, and 4,677,000 acres as limited to existing roads for motorized travel, for a total of 4,708,000 acres of restriction.

Alternative B would manage more acres with restrictions than Alternative A.

Effects under Alternative C

Alternative C would manage 1,300 acres as open to cross-country travel, 1,190,500 acres as closed to motorized and mechanized travel, 598,000 acres as closed to motorized travel with mechanized travel limited to existing routes, and 3,013,500 acres as limited to existing roads for motorized travel, for a total of 4,802,000 acres of restriction.

Alternative C would manage more acres as limited to existing routes for motorized and mechanized travel than Alternative A.

Effects under Alternative D

Alternative D would manage 22,700 acres as open to cross-country travel, 30,600 acres as closed to motorized and mechanized travel, 1,600 acres as closed to motorized travel with mechanized travel limited to existing routes, and 4,748,400 acres as limited to existing roads for motorized travel, for a total of 4,780,600 acres of restriction.

Alternative D would manage fewer acres as closed to motorized and mechanized travel than under Alternative A, but overall, Alternative D would manage more acres with restrictions than under Alternative A.

Effects under Alternative E

Alternative E would manage 55,700 acres as open to cross-country travel, 24,100 acres as closed to motorized and mechanized travel, 6,200 acres as closed to motorized travel with mechanized travel limited to existing routes, and 4,717,300 acres as limited to existing roads for motorized travel, for a total of 4,747,600 acres of restriction.

Alternative E would manage more acres as limited to existing routes for motorized and mechanized travel than Alternative A and, overall, would manage more acres with restrictions than Alternative A.

Soils: Effects from Lands and Realty

Effects Common to All Alternatives

Various construction activities and ROW authorized under lands and realty management (such as wind power, solar power, communication sites, transmission lines, roads, and pipeline projects) would impact soil resources as a result of surface disturbing activities. Erosion would vary, depending on the level of disturbance, the soil type, and BMPs implemented.

Effects under Alternative A

Alternative A would manage 564,100 acres as ROW exclusion, and would not manage any acres as ROW avoidance. Land Use Authorizations and management under Alternative A would provide the least protection for soil resources.

Effects under Alternative B

Alternative B would manage 580,000 acres as ROW exclusion and 1,195,800 acres as ROW avoidance, totaling 1,775,800 acres of land restriction that would provide protection of soil resources (more than Alternative A).

Effects under Alternative C

Alternative C would manage 2,675,800 acres as ROW exclusion and 369,300 acres as ROW avoidance, totaling 3,045,100 acres of land restriction. This would protect the most soil resources from potential impacts of lands and realty development.

Effects under Alternative D

Alternative D would manage 564,100 acres as ROW exclusion and 1,226,100 acres as ROW avoidance, totaling 1,790,200 acres of land use restriction that would protect soil resources. This is more than Alternative A.

Effects under Alternative E

Alternative E would manage 605,900 acres as ROW exclusion and 1,448,200 acres as ROW avoidance, totaling 2,054,100 acres of land restrictions that would prevent impacts on soil resources. This is more than under Alternative A.

Soils: Effects from Renewable Energy

Effects Common to All Alternatives

Potential impacts from renewable energy projects (solar, wind, and biomass) include direct impacts from ground-disturbing activities and erosion. All permits and ROWs would be subject to stipulations, restrictions, and mitigation measures, reducing the potential for impacts on soil resources. Under all

alternatives, the development of renewable energy in a timely manner to meet national, regional, and local needs would be encouraged.

Effects under Alternative A

Alternative A would manage 905,900 acres as variance areas for utility-scale solar development and would not manage any acres as ROW avoidance or exclusion areas for wind energy projects.

Effects under Alternative B

Alternative B would manage 773,400 acres as variance areas for utility-scale solar development and would manage 1,220,200 acres as ROW avoidance for wind energy projects. Alternative B would manage more acres with restrictions on renewable energy development than Alternative A, thus reducing the potential for impacts on soil resources.

Effects under Alternative C

Alternative C would manage 578,400 acres as variance areas for utility-scale solar development and no acres as ROW avoidance areas for wind energy projects. Alternative C would also manage 2,073,200 acres as ROW exclusion for wind energy projects. Alternative C would manage more acres with restrictions on renewable energy development than Alternative A, thus reducing the potential for impacts on soil resources.

Effects under Alternative D

Alternative D would manage 672,100 acres as variance areas for utility-scale solar energy and 1,228,100 acres as ROW avoidance areas for wind energy projects. Alternative D would manage more acres with restrictions on renewable energy development than Alternative A, thus reducing the potential for impacts on soil resources.

Effects under Alternative E

Alternative E would manage 629,900 acres as variance areas for utility-scale solar energy, and 956,900 acres as ROW avoidance areas for wind energy projects. Alternative E would also manage 629,900 acres as ROW exclusion for wind energy projects. Alternative E would manage more acres with restrictions on renewable energy development than Alternative A, thus reducing the potential for impacts on soil resources.

Soils: Effects from Areas of Critical Environmental Concern

Effects Common to All Alternatives

Under all alternatives, mitigation measures would be developed to reduce impacts to important resource values within ACECs which would also serve to reduce impacts on soils. All new and proposed ACECs (Alternatives B, C, D, and E) include use restrictions for salable, solid minerals, and fluid minerals. This would also protect soils.

Effects under Alternative A

Under Alternative A, 6 ACECs would continue to be managed, totaling 21,800 acres.

Effects under Alternative B

Alternative B would continue to manage 4 ACECs and would propose the designation of an additional 9 ACECs, totaling 371,170 acres. Alternative B would designate more acres as ACECs than Alternative A and would, therefore, be more protective of soil resources than Alternative A.

Effects under Alternative C

Alternative C would continue to manage 5 ACECs and would propose the designation of an additional 18 ACECs, totaling 786,270 acres. Alternative C proposes 17 more ACECs than Alternative A and would increase the acres managed as ACECs by more than 670,000 acres.

Effects under Alternative D

Alternative D would continue to manage 3 ACECs and would propose the designation of an additional 8 ACECs, totaling 180,000 acres. Alternative D would designate more acres as ACECs than Alternative A and would, therefore, be more protective of soil resources than Alternative A.

Effects under Alternative E

Alternative E would continue to manage 4 ACECs and would propose the designation of an additional 4 ACECs, totaling 82,770 acres. Alternative E would manage more acres as ACECs than Alternative A and would, therefore, be more protective of soil resources than Alternative A.

Soils: Effects from Wilderness Study Areas

Effects Common to All Alternatives

Managing acres as WSAs to maintain wilderness characteristics would restrict surface-disturbing activities and would indirectly reduce the potential for direct disturbance of soil resources. If Congress releases the WSAs and there are no management actions that restrict surface disturbance, the risk of impacts on soil resources from future surface-disturbing activities would increase.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Soils: Cumulative Impacts

Table 4-1 lists the reasonably foreseeable cumulative actions for the CCD.

Past and Present Actions

The BLM currently manages weed infestations through integrated weed management, including biological, chemical, mechanical, and educational methods. Due to the ability of noxious weeds to tolerate certain landscape conditions, some species are expected to remain a serious long-term threat. Vegetation treatments involving the use of mechanical, biological, and chemical treatments have been used in the past on both private and public rangelands, and would likely continue in the future. These treatments can impact soils through compaction and ripping of soils by heavy machinery during treatment.

Few impacts on soils from wildlife and special status species management have occurred and have been dependent on the timing, extent and type of habitat improvement projects. Generally, habitat improvement projects improve or protect soils. Managing to protect and rehabilitate wildlife and sensitive species habitat will continue.

Wildfires have exposed large areas where vegetation has been consumed increasing the likelihood or probability of soils to erode following wildfire. The implementation of ESR on areas burned by wildfire may continue based on the number of acres burned. ESR treatments would continue to be prioritized to provide for human life and safety, soil/water stabilization, restoration of important habitat for special status species, and to deter establishment of invasive plants.

Limited impacts on soils have occurred from wild horse and burro management. Areas experiencing concentrated wild horse and burro grazing have been prioritized for gathering of wild horses and burros, if above the upper AML, in order to maintain a thriving natural ecological balance. However, due to various constraints, gathers are not conducted as frequently as needed to continue to maintain a thriving ecological balance. This trend is expected to continue, and be exacerbated by the current drought conditions.

Minerals, renewable energy and lands and realty activities have also impacted soils in order to construct roads, drill pads, power lines and facilities. Mineral exploration and development is expected to continue to occur for locatable minerals, fluid mineral leasing, nonenergy mineral leasing, and mineral material disposables.

In response to demands for land use authorizations, the Designation of Energy Corridors on Federal Lands in the 11 Western States Programmatic EIS was published in 2007. Over the past 10 years the CCD has average issuance of approximately 28 ROW authorizations per year, with an average of 35 applied for annually.

Recreation activities have impacted soils where concentrated recreational use has occurred or in areas popular for OHV uses. These areas of higher OHV use experience increased vegetation community impacts, increasing potential for accelerated erosion of soils.

Reasonably Foreseeable Future Actions

Invasive weeds are expected to continue to spread across the landscape, carried by wind, humans, machinery, and animals, and alter current vegetation communities which may reduce soil stability and increase wildfire return cycles as areas containing invasive plants such as cheatgrass are more prone to reburn. Vegetation treatments involving the use of mechanical, biological, and chemical treatments will likely continue in the future. These treatments can impact soils through compaction and ripping of soils by heavy machinery during treatment.

Managing to protect and rehabilitate wildlife and sensitive species habitat will continue, and habitat improvement projects improve or protect soils.

Trends indicate that the number of wildfires will continue to gradually increase based on climate, conversion of habitat to areas dominated by nonnative, invasive species, and increased potential for human-caused fires due to population growth and increases in recreation uses.

Grazing pressure on rangelands from livestock and wild horses and burros is anticipated to continue. There is interest in acquiring grazing permits as they become available. In addition, due to proximity to expanding urban areas, some allotments may lose grazing acreage. This would ensure demand for areas that remain available for grazing.

Energy development is expected to continue. There are approximately 23 plans of operations for explorations (greater than 5 acres) or mining currently administered, 260 contracts for free-use permits for salable mineral operations, and 148 geothermal leases currently leased (BLM 2013f). The National Renewable Energy Laboratory data shows that portions of the planning area have high potential for solar energy, and Luning Solar was issued a ROW grant for a 575-acre project in July, 2010 but construction has not started.

Demands for land use authorizations in the planning area are anticipated to increase in correlation with future residential and commercial development in response to increasing population and energy demands. Population increases within the WUI will escalate demands for access to BLM-administered lands

near residential developments, which will require increased management and protection of resources.

Incremental Cumulative Impact – Combined Past, Present, Reasonably Foreseeable Actions – All Alternatives

Past, present, and reasonably foreseeable future actions and conditions within the cumulative effects analysis area that have impacts to soil resources include land use authorizations and energy development, mineral development, recreation, livestock grazing, wild horse and burro use, weeds and weed treatments, wildfire and climate change. Mineral and energy developments and ROWs have occurred, are occurring, and will continue to occur on both federal and nonfederal lands within the planning area. These actions have generally resulted in only minor effects on soils due to the implementation of BMPs and compliance with air quality standards. However, the number of soils disturbing activities could incrementally impact soil resources. Livestock grazing and wild horse and burro use would continue to impact soil resources but would be reduced through implementation of monitoring and mitigation. Impacts on soil resources from future wildfires would be affected by implementation of fuel treatments that would reduce fire size and soil rehabilitation efforts that would continue to reduce erosion and soil loss.

The incremental effects of management actions under all alternatives would be similar. Actions under all alternatives would be required to implement standard operating procedures, BMPs and mitigation as necessary and would be required to comply with state and federal air quality standards and requirements. Wildfire management actions that reduce fire size, spread, and frequency of occurrence would help reduce or stabilize loss of soils. The number and intensity of wildfire would be dependent on climate, weather, and increased potential for human-caused fires. Based on current monitoring trends, it is anticipated that incremental impacts would remain low. The effects of climate change would result in a cumulative impact on soil resources to the extent that climate change resulted in a change in hydrologic and other ecological regimes that altered the landscape in a manner that increased the potential for wildland fire and soil erosion.

Water Resources: Effects from Water Resources

Effects Common to All Alternatives

Under all alternatives, a common goal is to define watershed functions so cumulative effects within watersheds can be properly managed by the BLM. The BLM will collaborate with other federal agencies, tribal governments, the States of Nevada and California, counties, and local municipalities on management of municipal watersheds to meet local needs. Any proposed activities on sensitive soil types such as biological crusts, hydric or highly erodible soils would incorporate BMPs and other mitigation measures to minimize soil erosion and

maintain soil stability. Stabilizing soil erosion would reduce the potential transport of sediment into streams impacting surface water quality.

Effects under Alternative A

Under Alternative A, critical or at-risk watersheds will continue to be delineated as necessary in order to give these areas special consideration in activity plan development, with the goal of preventing accelerated soil loss and watershed degradation, associated flood and sediment damage to private property or adjacent lands, or to prevent destruction of important wildlife habitat. High erosion hazard and/or flood-prone areas will be delineated within the urban interface areas. These actions would protect water ecosystems and water quality by minimizing erosion which will reduce stream sedimentation and turbidity.

Effects under Alternative B

Under Alternative B, a listing of priority watersheds and priority water supply areas would be identified and maintained based on the following criteria:

- Watersheds with threatened and endangered species habitat (occupied and recovery streams)
- Presence of well head protection zones as defined in community well head protection plans, in accordance to the State of Nevada's well head protection program
- Watersheds that serve as important source areas for municipal and agricultural water supplies

These management actions would protect water availability in priority watersheds for people and threatened and endangered species within the planning area.

Effects under Alternative C

Under Alternative C, a listing of priority watersheds and priority water supply areas would be identified and maintained based on the same criteria described under Alternative B. However, Alternative C would also protect habitat containing threatened and endangered species habitat. These protections include surface disturbance reducing activities such as:

- Closing lands to mineral material disposals (except for government use at the Authorized Officer's discretion)
- Closing lands to nonenergy solid mineral leasing
- Applying NSO stipulations for fluid mineral leasing
- Managing priority watersheds as ROW exclusion areas

The actions under Alternative C would offer the most protections to water resources of all the alternatives due to the focus on the water quantity included

in Alternative B. Alternative C would increase water quality by reducing surface disturbance activities. These actions would reduce erosion and sedimentation into waterways.

Effects under Alternative D

Alternative D would protect priority watersheds similar to Alternative C by containing municipal water supply within 1,000 feet radius of municipal well heads as by applying the following management actions:

- Closing lands to mineral material disposals (except for government use at the Authorized Officer's discretion)
- Closing lands to nonenergy solid mineral leasing
- Applying NSO stipulations for fluid mineral leasing
- Managing priority watersheds as ROW exclusion areas

However, the Authorized Officer may consider allowing surface disturbance or surface occupancy in priority watersheds on a case-by-case basis based on the project meeting certain criteria such as recognition of valid existing rights or a proposed ROW with associated surface disturbance located within a designated ROW corridor. Impacts from these management actions would be similar to Alternative C due to the closures of surface disturbing activities, but to a lesser degree due to the lack of emphasis on focusing on threatened and endangered species.

Effects under Alternative E

Under Alternative E, impacts would be the same as under Alternative D.

Water Resources: Effects from Vegetation Resources

Effects Common to All Alternatives

Vegetation: Invasive, Nonnative Species, and Noxious Weeds

Under all alternatives, control of invasive, nonnative, and noxious weeds would improve water quality and quantity in areas where impacts have occurred. In disturbed areas, noxious weeds tend to out-compete native species creating monocultures which are typically poorly suited to protect soils from erosional forces and can alter water movement in the soil. Increased erosion and sedimentation to water bodies can result in changes to water chemistry and alter stream channel morphology.

Effects under Alternative A

Vegetation: Invasive, Nonnative Species, and Noxious Weeds

Alternative A would continue to coordinate with the Navy and other appropriate agencies to implement approved integrated pest management plans to control and remove undesirable vegetation. Although short-term surface

disturbances can occur from the eradication of noxious weeds, long-term benefits to soils and water resources include surface stabilization with desirable species and reduced erosion potential.

Effects under Alternative B

Vegetation: Invasive, Nonnative Species, and Noxious Weeds

Alternative B would implement weed management stipulations and public education to reduce the spread of invasive, nonnative species, and noxious weeds along perennial stream corridors. Control methods include mechanical, biological, and chemical treatments that may be used alone or in combination. The management actions under this alternative offer the least protection to water resources by using chemicals that could enter water ways through runoff.

Effects under Alternative C

Vegetation: Invasive, Nonnative Species, and Noxious Weeds

Alternative C would implement control methods such as mechanical and biological treatments that may be used alone or in combination. The BLM would only utilize mechanical weed treatments riparian areas. This method does not apply chemicals that can kill the soil food web where being applied, but it can be more time consuming and require multiple treatments. The management actions under this alternative offer water quality the most protection by not using chemicals that can enter water ways through runoff.

Effects under Alternative D

Vegetation: Invasive, Nonnative Species, and Noxious Weeds

Alternative D impacts would be the same as those in Alternative B.

Effects under Alternative E

Vegetation: Invasive, Nonnative Species, and Noxious Weeds

Alternative E impacts would be the same as those in Alternative B.

Water Resources: Effects from Fish and Wildlife Management

Effects Common to All Alternatives

Under all alternatives, a common goal is to manage vegetation communities that provide the food, cover, and breeding requisites for existing and potential native or otherwise desirable species of fish and wildlife in order to sustain and optimize their distribution and abundance consistent with habitat capability. These goals would allow for opportunities to maintain overall ecosystem health and to preserve water quality and sustainability of stream flow. This would include, for example, implementing timing restrictions and distance buffers, as appropriate, to minimize impacts on wildlife from activities during important life cycle periods. These actions would temporarily limit disturbances to soil and

vegetation. As a result, it would be less likely for erosion to occur that could degrade water quality in the areas with timing restrictions and distance buffers. Overall, management actions for fish and wildlife management would help protect water resources.

Effects under Alternative A

Impacts would be the same as those under *Effects Common to All Alternatives*. This makes Alternative A the least protective of water resources.

Effects under Alternative B

Alternative B would apply CSU stipulations to fluid mineral leasing within 500 feet of lentic and lotic habitats occupied by federally listed aquatic and semi-aquatic species. The BLM would manage areas with priority habitat for fish and wildlife as ROW avoidance areas with a 100-foot buffer for aquatic habitats. These actions would limit disturbances to soil and vegetation near aquatic areas. As a result, it would be less likely for erosion to occur that could degrade water quality in these areas.

Effects under Alternative C

Alternative C would apply NSO stipulations with no exceptions, modifications or waivers to fluid mineral leasing within 500 feet of lentic and lotic habitats occupied by federally listed and BLM sensitive aquatic and semi-aquatic species. This would generally provide the same level of protection as closing the entire area to leasing. This is because, while the mineral would still be available for extraction beneath the surface, facilities would be located outside of any lentic and lotic habitats. Also, areas with priority habitat for fish and wildlife would be managed as a ROW avoidance area with a 500-foot buffer for aquatic habitats. Protection of water resources would be similar to Alternative B, but with greater intensity due to the larger buffer. These actions make Alternative C the most protective of water resources.

Effects under Alternative D

Under Alternative D, impacts on water resources from fish and wildlife management actions would be the same as Alternative B.

Effects under Alternative E

Alternative E would apply NSO stipulations with exceptions, modifications or waivers to fluid mineral leasing within 500 feet of lentic and lotic habitats occupied by federally listed and BLM sensitive aquatic and semi-aquatic species. Also, areas with priority habitat for fish and wildlife would be managed as a ROW avoidance area with a 100-foot buffer for aquatic habitats. These actions would limit disturbances to soil and vegetation near aquatic areas. As a result, it would be less likely for erosion to occur that could degrade water quality in these areas, except in areas where exceptions, modifications, or waivers occurred.

Water Resources: Effects from Wildland Fire Ecology and Management

Effects Common to All Alternatives

Fire removes vegetation cover and exposes soils to erosion, increasing the potential for sediments to be transported into water resources. Combustion can create a variety of toxic chemicals that may eventually be transported to water bodies in runoff or because of atmospheric deposition. Fire suppression can result in soil disturbance from vehicles and equipment such as fire engines and dozers. Impacts include removal of vegetation and disturbance to soils increasing erosion potential and impacts on water. Use of retardant may impact water directly. These impacts are greater to lentic resources versus perennial streams because lentic areas are less dynamic and slower to recover. Impacts include reduced water quality and possible oxygen depletion.

Effects under Alternative A

Alternative A would continue to implement ESR on areas burned by wildfire based on the number of acres burned by wildfires. ESR treatments would continue be prioritized to provide for human life and safety, soil/water stabilization, restoration of important habitat for special status species, and to deter establishment of invasive plants. The reduction of invasive plants establishing will protect water resources by reducing erosion and sedimentation to water bodies which can result in changes to water chemistry and alter stream channel morphology.

Effects under Alternative B

Alternative B would conduct rehabilitation projects to stabilize soils; reestablish hydrologic function; maintain and enhance biological integrity; promote plant resiliency; limit expansion or dominance of invasive species; and reestablish native species. These actions would help maintain water qualities that benefit aquatic species by reducing the potential for erosion.

Effects under Alternative C

Alternative C would conduct more suppression, which, because it implies maintenance of conditions that may be out of equilibrium with the natural threat of fire, could be unsustainable in the long-term and result in greater loss of vegetation cover in individual fires. Loss of vegetation cover can lead to soil erosion, and larger fires at less frequent intervals might also lead to more soil erosion over a longer period of time, with greater effects on water quality than if the fires are smaller and more frequent.

Effects under Alternative D

Alternative D would implement hazardous fuels reduction projects where the negative impacts of wildland fire are greatest to health and safety within the urban interface. Fuels treatments would be designed and implemented to create fire safe communities resistant to catastrophic wildfire events. Also, rehabilitation projects after fire would be similar to those described in

Alternative B. These actions would protect water quality by reducing the potential for erosion.

Effects under Alternative E

Alternative E would implement hazardous fuels reduction projects where the negative impacts of wildland fire are greatest to health and safety, sensitive biological, cultural, and other natural resources. These actions would preserve water quality by focusing hazardous fuels reduction activities on sensitive biological and natural resources.

Water Resources: Effects from Livestock Grazing Management

Effects Common to All Alternatives

Livestock grazing can impact water resources by changing stream channel morphology, destroying riparian vegetation, altering watershed hydrology, and impairing water quality (Agouridis et al. 2005). These impacts are due to the presence of livestock increasing soil erosion and water pollution from runoff. Water quality can be impaired by grazing animals directly by depositing urine and manure into surface water or indirectly by depositing manure and urine near surface water where runoff and leaching can transport these materials into the water.

The BLM can manage the effects of livestock grazing on water quality by controlling the timing, intensity, duration, and spatial distribution of grazing (Agricultural Research Service 2013). These impacts vary between alternatives due to the different acres available or unavailable and the number of AUMs available for livestock grazing.

Effects under Alternative A

Alternative A would manage livestock grazing without the option to make unavailable allotments where ecological function continues to decline due to grazing after management changes have been implemented.

Under Alternative A, the BLM would continue to manage livestock use at 151,200 total AUMs. The BLM would manage 4,796,600 acres as available for all classes of livestock grazing, and 6,700 acres would not be available.

Effects under Alternative B

Alternative B would make unavailable allotments where management changes have been implemented but ecological function is still decreasing due to grazing. The resultant vacant allotments could be offered for application to a new permittee.

Under Alternative B, the BLM would continue to manage livestock use at 151,200 AUM. The BLM would manage 4,797,200 acres as available for all classes of livestock, and 6,100 acres would not be available. This alternative would offer fewer impacts on water resources due to more acres being

unavailable to livestock grazing than Alternative A and continuous year-long grazing would not be allowed in any pasture of an allotment.

Effects under Alternative C

Alternative C would make unavailable allotments as they become vacant. This would result in an overall decrease in livestock grazing on the landscape through the life of the RMP. This would reduce effects from livestock grazing on water resources but would also remove any range management and improvement features that may be improving soil stability and health, which would affect water resources.

Under Alternative C, the BLM would reduce AUMs at a periodic review for allotments not meeting Rangeland Health Standards due to current livestock grazing. The BLM would manage 2,101,300 acres as available for all classes of livestock grazing, and 2,702,000 acres would be unavailable for all classes of livestock grazing. This alternative would make the most acres unavailable to livestock grazing compared to the other alternatives, resulting in the fewest impacts on water quality.

Effects under Alternative D

Alternative D would make unavailable allotments where management changes have been implemented but ecological function is still decreasing due to grazing, or if livestock grazing is incompatible with urban uses.

Under Alternative D, the BLM would manage grazing at existing levels, and re-examine and adjust use levels to appropriate AUM amounts every 10 years or on a case-by-case basis (whichever is less) during the periodic review of the permitted use in a grazing permit. The BLM would manage 4,792,600 acres as available for all classes of livestock grazing, and 10,700 acres as unavailable for all classes of livestock grazing. This alternative would offer fewer impacts on water resources due to more acres being unavailable to livestock grazing than Alternative A.

Effects under Alternative E

Alternative E would make unavailable allotments where management changes have been implemented but ecological function is still decreasing or failing to reach other defined objectives due to livestock. Allotment boundaries would be modified to address incompatible urban uses. This would reduce the compounding impacts from urban and grazing use on water resources in these areas.

Management at existing levels, and re-examine and adjust use levels to appropriate AUM amount every 10 years or on a case-by-case basis (whichever is less) would occur during the periodic review of the permitted use in a grazing permit. The BLM would manage 4,797,200 acres as available for all classes of livestock grazing. 6,100 acres would be unavailable to all classes of livestock

grazing. This alternative would offer fewer impacts on water resources due to more acres being unavailable for livestock grazing than Alternative A.

Water Resources: Effects from Geology and Mineral Management

Effects Common to All Alternatives

In areas with NSO stipulations, both surface and ground water quality would be protected. Since ground disturbance would be prohibited and soil erosion limited to natural processes accelerated soil erosion would be limited, decreasing the potential for sedimentation of surface streams. Groundwater would be protected because geothermal wells would not affect groundwater levels. However, indirect well drilling under a parcel with an NSO stipulation may affect groundwater. In areas with CSU stipulations, water quality would receive some protection since ground disturbance would often be limited.

Closing lands to fluid minerals leasing would reduce the release of pollutants capable of contaminating surface water during runoff or contaminating aquifers during groundwater recharge. By managing lands as open to fluid mineral leasing, there is the potential for actions to occur in fluid minerals development areas that could alter drainage patterns, stream hydrographs, and water supplies. These impacts would be avoided in areas closed to fluid mineral leasing.

The severity of these direct and indirect impacts would vary, depending on the different types of minerals leasing activities and the intensity of development, as well as the type, volume, and management of contaminants at mineral development sites. Under Alternatives C, D, and E, priority watersheds and habitat containing threatened and endangered species habitat would be managed as closed to nonenergy solid mineral leasing and to mineral material disposals (except for government use at the Authorized Officer's discretion). The Authorized Officer may consider allowing surface disturbance and/or surface occupancy in priority watersheds on a case-by-case basis based on the project meeting one of the following management criteria:

- Recognition of valid existing rights
- A determination made through consultation with United States Fish and Wildlife Service (USFWS)
- Determination that the proposed actions and associated surface disturbance would:
 - a. Protect, mitigate, or improve wildlife/fish habitat
 - b. Provide for public safety or local water supply
- A proposed ROW and associated surface disturbance is located within a designated ROW corridor
- Surface disturbance defined as casual use

Impacts on water resources from a project meeting one of these criteria and occurring in a priority watershed include: sedimentation, contamination, and alteration of surface and subsurface water bodies. The severity of these indirect impacts would vary, depending on the different types of locatable, mineral materials, and leasable activities and intensity of development.

Effects under Alternative A

Alternative A would continue to close 839,100 acres of BLM-administered surface/federal minerals to fluid minerals leasing, and 3,964,200 acres of BLM-administered surface/federal minerals would be managed as open to fluid minerals leasing. Impacts from these open and closed areas are described under effects common to all. Per the Lahontan RMP Management Decisions Summary, activities within 500 feet of water would be open with NSO stipulations. Per the Walker RMP Management Decisions Summary, activities within 300 feet of any water would be open with NSO stipulations. Together these NSO stipulations would be applied to 700 acres.

Effects under Alternative B

Alternative B would close 768,500 acres of BLM surface/federal minerals to fluid minerals leasing, and 4,034,700 acres of BLM surface/federal minerals would be managed as open to fluid minerals leasing. The BLM would apply NSO stipulations to 404,600 acres and CSU stipulations to 2,120,200 acres. Water resources in these areas would be positively impacted in this alternative more than Alternative A, because more acres would be protected by constraining or restricting use or occupancy of the land surface with CSU and NSO stipulations.

Effects under Alternative C

Alternative C would close 2,081,700 acres of BLM surface/federal minerals to fluid minerals leasing, and 2,721,500 acres of BLM surface/federal minerals would be managed as open to fluid minerals leasing. The BLM would apply NSO stipulations to 1,039,200 acres and CSU stipulations to 1,242,800. This alternative restricts surface use and disturbance more than any other alternative and would provide the most protection to water resources.

Effects under Alternative D

Alternative D would close 737,000 acres of BLM surface/federal minerals to fluid minerals leasing, and 4,066,200 acres of BLM surface/federal minerals would be managed as open to fluid minerals leasing. The BLM would apply NSO stipulations to 864,800 acres and CSU stipulations to 2,071,400 acres. Water resources in these areas would be positively impacted in this alternative more than Alternative A, because more acres would be protected by constraining or restricting use or occupancy of the land surface with CSU and NSO stipulations.

Effects under Alternative E

Alternative E would close 1,007,200 acres of BLM surface/federal minerals as closed to fluid minerals leasing, and 3,796,000 acres of BLM surface/federal minerals would be managed as open to fluid minerals leasing. The BLM would

apply NSO stipulations to 1,151,600 acres and CSU stipulations to 1,844,900 acres. Water resources in these areas would be positively impacted in this alternative more than Alternative A, because more acres would be protected by constraining or restricting use or occupancy of the land surface with CSU and NSO stipulations.

Water Resources: Effects from Recreation and Visitor Services

Effects Common to All Alternatives

Since recreation is the management focus in SRMAs, management of SRMAs could result in more impacts on water resources; however, recreation impacts in these areas are largely dependent on the type of recreation that is the subject of the SRMA. Recreational activities such as motorized vehicle use can cause soil erosion and degrade water quality by runoff of fuels into surrounding surface water. These activities, however, would likely be monitored more than areas lacking the recreation designation and therefore, impacts could be minimized through monitoring.

Many recreation destinations center on areas where perennial surface water is present, such as streams or lakes in upper watersheds. These are often sensitive areas, where increased visitor use might lead to soil compaction (as at campsites or on trails), increased use of OHVs, and generation of water pollutants (e.g., sanitary waste, pathogens). Increased visitor use might require additional support facilities and infrastructure, such as improved access roads, potable water, sanitary facilities, waste disposal, and other facilities. Each of these can have adverse impacts on water resources. Improved access may lead to more visitor use and demand for more support facilities. Some areas in the planning area are remote, but there is increased demand for recreation opportunities from urban expansion in the Reno area. Therefore, increased concentration of visitor use on the few areas with desirable riparian settings is likely to result in increased impacts on the water resources.

Demand for OHV use areas is increasing. OHV use can disturb soils and increase erosion. OHV destinations would typically include riparian areas, which are particularly vulnerable to OHV use. All of the alternatives include measures to monitor and control visitor use and associated impacts on other resources, but the alternatives differ in the degree and type of recreational development they would promote.

Effects under Alternative A

Alternative A would continue management of existing SRMAs, while the other alternatives would designate new ones. Designation of new SRMAs is a response to known and perceived public demand for recreational opportunities. SRMAs provide a means of formally planning and managing recreational uses within a defined geographic area. Designation of SRMAs would not impact water

resources; however, the management actions applied to SRMAs may result in effects on water resources.

Effects under Alternative B

Alternatives B, C, and D each include similar adaptive management measures recognizing the need to protect other resource values as recreational use expands. This may help to adjust visitor use to prevent adverse effects on water resources. Under Alternative B, the BLM would manage 95,300 acres as open to OHV use, 26,700 acres would be closed to OHV use, and 4,677,000 acres of OHV use would be limited to existing trails. Although fewer closures would occur under this alternative than Alternative A, more than 4.6 million acres would be managed as limited to existing routes, resulting in fewer impacts on water resources than under Alternative A.

Effects under Alternative C

Under Alternative C, the BLM would manage 1,300 acres as open to OHV use, 1,190,500 acres as closed to OHV use, and 3,013,500 acres of OHV use would be limited to existing trails. This alternative would close the most acres to OHV use, resulting in the greatest protection of water resources.

Effects under Alternative D

Under Alternative D, the BLM would manage 22,700 acres as open to OHV use, 30,600 acres as closed to OHV use, and 4,748,400 acres of OHV use would be limited to existing trails. Impacts would be similar to those under Alternative B.

Effects under Alternative E

Under Alternative E, the BLM would manage 55,700 acres as open to OHV use, 24,100 acres as closed to OHV use, and 4,717,300 acres of OHV use would be limited to existing trails. Impacts would be similar to those under Alternative B.

Water Resources: Effects from Comprehensive Travel and Transportation Management

Effects Common to All Alternatives

Impacts from motorized recreation include: disrupted soil crusts, reduced vegetation, sedimentation in surface water, and turbidity in surface water. When soil is disturbed and vegetation is removed from the surface of a landscape, the amounts and velocities of runoff can increase, which accelerate the rates at which sediments and other debris are eroded from the land and washed to downslope aquatic systems. It can also alter groundwater recharge rates.

Water quality can be impacted when pollutants from motorized vehicle emissions and spills of petroleum products are absorbed by sediments and plant material or dissolved in runoff. Once mobilized, these contaminants may enter aquatic systems (Ouren et al. 2007). Each alternative varies in the amount of acres managed as open, limited, or closed to motorized and mechanized travel in priority watersheds. Closing areas and limiting the miles of routes in priority

watershed would protect these areas from disturbance such as compaction, erosion, and runoff. As a result, alternatives that close more acres or miles of routes to travel would best protect water resources (See **Table 4-2**, Acres of Routes Overlapping Priority Watersheds by Alternative).

Table 4-2
Acres of CTTM Designations Overlapping Priority Watersheds by Alternative

Roads and Trails with motorized Use	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Open to Unrestricted vehicle use	366,400	54,500	0	5,800	16,600
Limited to Existing Routes	156,600	469,500	291,000	518,300	508,200
Closed to Motorized and Mechanized Travel	1,600	0	80,400	0	1,100
Closed to motorized Travel and Limited to Existing Routes for Mechanized Travel	2,100	2,600	155,300	2,600	700

Source: BLM GIS 2014a, BLM GIS 2014b, GBGS GIS 2013

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Water Resources: Effects from Lands and Realty

Effects Common to All Alternatives

ROW actions that could release pollutants capable of contaminating surface water during runoff or contaminating aquifers during groundwater recharge could occur in ROW avoidance areas. Also, ROW actions that could alter drainage patterns and recharge rates for groundwater, which affect stream hydrographs and water supplies, could occur in ROW avoidance areas; however, ROW avoidance areas would generally result in lower impacts on water quality, compared with areas not managed as ROW avoidance. These impacts would not occur in ROW exclusion areas because ground disturbance

would be prohibited and soil erosion would be limited to natural processes. The severity of impacts would vary, depending on the type of ROW, intensity of development, and site-specific geomorphic conditions.

Effects under Alternative A

Alternative A would manage 77,500 acres as ROW exclusion areas and no acres as ROW avoidance in priority watersheds. These management actions would provide the fewest protections to water resources compared to the other alternatives.

Effects under Alternative B

Impacts under Alternative B would be fewer than Alternative A because the BLM would manage 77,500 acres as ROW exclusion areas and 103,700 acres as ROW avoidance areas in priority watersheds. These ROW avoidance areas would provide some protection to water resources but still allow for some ground disturbance.

Effects under Alternative C

Alternative C would manage 526,700 acres in priority watersheds and habitats containing threatened and endangered species as ROW exclusion areas. Water quality in these areas would be protected the most out of all the alternatives since ground disturbance would be prohibited and soil erosion would be limited to natural processes. The BLM would manage no acres as ROW avoidance areas in priority watersheds since all priority watersheds are already managed as ROW exclusion areas.

Effects under Alternative D

Alternative D would protect priority watersheds containing municipal water supply within 1,000 feet radius of municipal well heads. The BLM would manage these areas as ROW exclusion. Additionally, the BLM would manage 77,500 acres as ROW exclusion areas. This would result in protections similar to Alternative B but over a larger area due to the 115,900 acres managed as ROW avoidance.

Effects under Alternative E

Alternative E effects would be similar to Alternative D, but more protective due to the additional acres being managed as ROW exclusion and avoidance. This alternative would allow for management of 81,100 acres as ROW exclusion and 138,200 acres being managed as ROW avoidance in priority watersheds.

Water Resources: Effects from Renewable Energy

Effects Common to All Alternatives

Development of renewable energy would require road access to the sites. All projects would involve construction, soil disturbance, and the potential for enhanced erosion to impact surface water quality. Solar projects tend to be located on level terrain, such as on valley floors, where there are few sensitive

surface water resources, and soil erosion by water would tend to not be significant.

Wind farms typically consist of a series of turbines located along ridges, at the highest points in a watershed. Typically, soils are thin and the terrain is rocky in these areas. There may be few existing roads and these may be unsuitable for transporting the components and equipment to the site. Constructing new roads or improving existing roads is likely to result in enhanced erosion and a potential threat to surface water quality. Roads would need to be maintained to allow continued access for turbine maintenance.

Impacts on water resources from renewable energy development would vary based on resource-specific and project-specific conditions. Generally, concentrating solar projects would require the greatest amount of water during operation, while wind energy and photovoltaic projects would require only moderate amounts of water resources. In all cases, some supply of water is usually needed to meet the demand to operate these projects for example solar projects often require a water source for cleaning solar panels. These impacts will vary under each alternative due to the acres of land open for solar development and acres of land being managed as ROW avoidance areas.

Effects under Alternative A

Alternative A would manage the most acres of land (80,600) for solar energy development within priority watersheds and would manage no acres as ROW avoidance in wind energy projects. These management actions would result in the greatest impact of all the alternatives on water resources.

Effects under Alternative B

Alternative B would open fewer acres for solar energy development (71,600) in priority watersheds than Alternative A. Alternative B would manage the fewest acres as ROW avoidance (145,400 acres) for wind energy projects other than Alternative A. These factors result in moderate to high impacts compared to Alternative A.

Effects under Alternative C

Alternative C would manage priority watersheds as closed to solar energy development and the most acres as ROW exclusion (268,100 acres) for wind energy projects; this alternative would have the fewest impacts on water resources.

Effects under Alternative D

Alternative D would close acres in priority watersheds to solar energy development and would manage more acres as ROW avoidance (145,500 acres) for wind energy projects than Alternative A, resulting in moderate impacts on water resources.

Effects under Alternative E

Alternative E would close acres in priority watersheds to solar energy development and would manage more acres as ROW avoidance (112,800 acres) for wind energy projects than Alternative A, resulting in moderate to low impacts on water resources.

Water Resource: Effects from Areas of Critical Environmental Concern

Effects Common to All Alternatives

ACECs protect the integrity of sensitive and unique areas within the planning area through restrictions or prohibition of surface-disturbing activities. Where there are restrictions on surface-disturbing activities to protect ACECs, water resources would benefit through the management for other special resource values, such as soils and vegetation. Management of highly erodible soils can prevent increased turbidity in downstream waters and vegetation can help filter contaminants from runoff and contributes to soil stabilization.

Effects under Alternative A

Alternative A would continue managing current ACECs (21,800 acres total) using current land use plan decisions, policy, and regulations. This alternative would provide no new indirect protection to soils and water.

Effects under Alternative B

Alternative B would manage 371,170 acres as current and proposed ACECs. This would provide more indirect protection from surface disturbances to soils and water than Alternative A.

Effects under Alternative C

Alternative C would manage 786,270 acres as current and proposed ACECs. This would provide the most indirect protection from surface disturbances to soils and water of all the alternatives.

Effects under Alternative D

Alternative D would manage 180,000 acres as current and proposed ACECs. This would provide more indirect protection from surface disturbances to soils and water than Alternative A.

Effects under Alternative E

Alternative E would manage 82,770 acres as current and proposed ACECs. This would provide more indirect protection from surface disturbances to soils and water than Alternative A, since more acres would be designated as ACECs.

Water Resources: Cumulative Impacts

Incremental Cumulative Impact – Combined Past, Present, Reasonably Foreseeable Future Actions – All Alternatives

The management actions proposed in the RMP in conjunction with the past and present activities as well as reasonably foreseeable future actions would have varying impacts on water resources and are summarized by action/reasonably foreseeable future action group below:

- Livestock grazing and wild horse and burro management would result in changes to the current state of water resources unless AUMs and AMLs are adjusted as necessary to protect water resources.
- Mineral resource management would not likely cause any change to the current state of water quality due to NSO and CSU stipulations in priority watersheds.
- Lands and realty actions would continue to add to impacts on water resources as more rights of way which cross water resources are granted. Mitigation would, in general, reduce or negate these impacts on a case-by-case basis.
- Renewable energy exploration and development would not likely impact the current state of ground water resources or surface water quantity assuming a disconnection between the geothermal resource and other aquifers is maintained. The addition of geothermal plants in the planning area would have an additive effect on the potential to decrease surface water quality either during construction or through disruption of surface flow patterns. Project design requirements and mitigation would, in general, reduce or eliminate these impacts.
- Recreational use is expected to increase as population of the planning area increases, which would have an additive effect on reducing surface water quality.
- Priority wildlife habitat areas and special status species management would have a compounding effect on surface water resource by providing for greater protection or preservation of streams as well as the surrounding landscapes.
- Wildland fire management would not likely lead to a measurable change in the current state of water resources.

Incremental impacts on water quality would range from low to moderate and would depend on uses being in compliance with State of Nevada water law, quality standards and permit requirements. Other factors include continued grazing management to meet land health standards, the size and degree of use

restrictions and mitigation measures, the location and number of project developments, and OHV travel management designations.

4.3.4 Vegetation

Summary

The greatest impacts on vegetation, including rangelands, riparian and wetland areas, and invasive weeds, would be from livestock grazing, wild horse and burro activity, water resources management, and wildland fire actions. Special status species and soils management actions would benefit rangelands and riparian and wetland areas by promoting restoration. Surface-disturbing activities on BLM-administered land, including construction, implementation, and maintenance activities; fence building; road maintenance; wild horse and burro gathers; livestock herding; recreational activities such as camping, hiking, and backpacking; vegetation treatments; and site excavations for data recovery would cause short-term disturbance of vegetation by removal or trampling, which may allow weeds to become established.

The effects of each action on vegetation resources are quantified when possible; however, many impacts must be qualitatively assessed when suitable data are not available. A more detailed analysis would follow at the implementation stage, such as an allotment evaluation or a periodic review.

Alternative C would provide the most protection to vegetation, including riparian and wetland vegetation, by restricting development activities and OHV use in these areas. Alternative E would provide a more flexible approach by protecting these areas while allowing for multiple uses. Alternatives A, B and D would provide less protection for riparian and wetland areas. Management actions in the areas of socioeconomic effects and environmental justice would not impact vegetation resources.

Methods of Analysis

Methods and Assumptions

Impacts are determined by assessing which actions, if any, would change vegetation structure or composition, decrease the extent of rangeland or riparian vegetation, allow for increased dominance of invasive weeds, affect habitat value for wildlife species, or decrease grazing potential. Impacts were assessed according to the following methods and assumptions:

- Activities generally affect vegetation by changing plant composition, seral condition, structure, production, and ground or canopy cover.
- Some impacts will be direct, while others will be indirect and affect vegetation through a change in another resource. Direct impacts on vegetation are damage, trampling, or removal of vegetation, resulting in a reduction in areas of native vegetation; mortality

resulting from application of herbicides; and actions that unequivocally reduce total numbers of plant species or reduce or cause the loss of total area, diversity, vigor, structure, or function of wildlife habitat.

- Indirect impacts include those that cannot be absolutely linked to one action, such as decreased plant vigor or health from reduced water quality or quantity. Potential indirect impacts include loss of habitat due to surface disturbance, compaction or occupancy; introduction of noxious and invasive weeds or conditions that enhance the spread of weeds; loss of or reduced size of riparian areas or reduced plant vigor due to reduction of surface water flows as a result of groundwater pumping.
- Many actions will be subject to BMPs. Although BMPs are designed to minimize the effects of projects, they generally cannot eliminate all impacts. This impact analysis assumes that BMPs will minimize but not eliminate possible effects.
- Acres impacted by wildland fire are expected to increase over the life of the plan.
- Appropriate vegetative management will maintain or improve native plant communities to protect soil and water resources while providing habitat, and limit grazing to a level that will not impair plant health.
- Weeds often exploit disturbed areas and are adept at outcompeting many native species; most actions that disturb soils or vegetation will increase the potential for weed infestation.
- Weed infestation will often follow transportation routes, making transmission corridors, roadsides, and trails prime habitat for weeds and making vehicles prime mechanisms for the spread of weeds
- Noxious and invasive weeds will continue to be introduced and spread as a result of ongoing vehicle traffic, recreational activities, wildlife and livestock grazing, and surface-disturbing activities.
- Noxious and invasive weeds will further expand into native plant communities, and disturbances to these communities would expand opportunities for the spread of non-native invasive plant species; and the BLM would continue to treat noxious and invasive weeds and pests.
- Weeds are most likely to thrive in disturbed areas, including burned areas, along road cuts or in staging areas, degraded or unhealthy rangelands, and where soils have been disturbed.
- Weed and pest control will be carried out in coordination with the appropriate county, weed and pest control district, and owners of

adjacent property, but total control of the spread of noxious weeds is unlikely under any alternative.

The following indicators were used to assess the degree of impacts on vegetation:

- Vegetation types impacted
- Acres of vegetation lost or restored

Nature and Type of Effects

The nature and type of effects vary by resource and alternative as described in the following sections.

Vegetation: Effects from Air Quality Management

Effects Common to All Alternatives

Restrictions on prescribed fire use to protect air quality may reduce opportunities to burn in any given year. This may indirectly hinder the achievement of vegetation management goals by preventing certain treatments from being implemented. However, these restrictions would be unlikely to completely prevent implementation over the long term, so impacts are likely to be minor.

Vegetation: Effects from Climate Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under Alternative A, there is no consideration of climate change impacts in project design and operations. Climate change would continue without a planned BLM response, which could result in fragmentation of vegetation communities, a decrease in suitable habitat for some plant species, and an increase for others.

Effects under Alternative B

Under Alternative B, climate change impacts would be considered in project approval and funding, and specialists would use adaptive management in considering climate change in project design and operation. Rapid Ecological Assessment would be employed to assess impacts of climate change on vegetation and maintain connectivity of habitat areas. These approaches would increase the ability of BLM management to respond to climate change. Adaptive management for climate change would improve management of vegetation resources.

Effects under Alternative C

Effects under Alternative C would be the same as under Alternative B.

Effects under Alternative D

Effects under Alternative D would be the same as under Alternative B.

Effects under Alternative E

Effects under Alternative E would be the same as under Alternative B.

Vegetation: Effects from Soil Resources

Effects Common to All Alternatives

Measures to reduce soil erosion, such as seeding and improving vegetative cover, would reduce compaction and increase infiltration. This would indirectly improve vegetation health over the short term. As a result, vegetative productivity and diversity would be increased. This would increase litter, soil fertility, infiltration, and nutrient cycling in the long term.

Effects under Alternative A

Alternative A limits OHV use to designated roads and trails in highly erosive soil areas. This approach would protect vegetated areas not currently used as roads or trails.

Effects under Alternative B

Alternative B would apply an erosion control plan to projects on slopes, would apply soil amendments to minimize soil disturbance, and apply a CSU stipulation on highly erosive soils. These management approaches would diminish erosion and soil damage and protect vegetation more than Alternative A,

Effects under Alternative C

In addition to the approaches under Alternative B, Alternative C would minimize soil crust breakage by applying mulch or lop and scatter techniques when thinning pinyon-juniper. These management approaches would diminish erosion and soil damage compared to Alternative A and would better protect vegetation.

Effects under Alternative D

In addition to the approaches under Alternatives B and C, Alternative D would also mandate re-seeding of disturbed soils to minimize erosion. Along with Alternative E, Alternative D includes the most specific actions to reduce soil damage.

Effects under Alternative E

Effects under Alternative E would be similar to those described for Alternative D.

Vegetation: Effects from Water Resources

Effects Common to All Alternatives

Many water sources (excluding underground) in the planning area are associated with riparian and wetland areas, the protection of which would be assessed when obtaining, using, or developing these water sources.

Effects under Alternative A

Alternative A limits BLM-authorized activities in degrading watersheds and specific portions of urban watersheds at immediate risk of degradation, and limits OHV use in riparian areas. These approaches protect water supply in specific localized areas, but provide limited oversight of watershed health and water quality on a regional scale. Impacts on water resources would be reduced by complying with water quality regulations and implementing BMPs and land health standards. This would indirectly protect vegetation. However, Alternative A would provide the fewest action- and location-specific protections of all alternatives.

Effects under Alternative B

In addition to the efforts under current management, Alternative B and the other action alternatives would establish a listing of priority watersheds and priority water supply areas based on presence of wildlife habitat, among other factors. These policies may improve vegetation management in riparian areas by more effective management of water supply.

Effects under Alternative C

In addition to the approach under Alternative B, Alternative C would also use permitting, land acquisitions, and other realty actions to acquire minimum pool and in-stream flows or to gain access to water sources or developments. The actions would improve hydrologic function in riparian areas.

Effects under Alternative D

Effects under Alternative D would be similar to those described for Alternative C.

Effects under Alternative E

Effects under Alternative E would be similar to those described for Alternative C.

Vegetation: Effects from Vegetation Management

Effects Common to All Alternatives

Vegetation treatments would continue to occur on rangelands to meet land health standards. Range improvements would result in direct, minor, and short-term disturbances to vegetation, including loss of vegetation cover and changes in plant composition near each project. Indirect effects include increased susceptibility to noxious and invasive weeds transported by livestock, wild

horses and burros, wildlife, recreational activities, and other disturbances. Actions to decrease weeds on BLM-administered lands would indirectly improve rangeland health and community composition by increasing native species, restoring a more natural fire regime, and decreasing the risk of catastrophic wildfire in both the short and long term. Post-fire rehabilitation efforts, including temporary grazing closures, would reduce the ability for weeds to invade and would support native species growth. This would indirectly help to achieve healthy rangeland conditions in the long term.

Riparian and wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high water flows. Specific objectives for meadows and riparian areas would prioritize restoration of these communities, making restoration efforts more effective and efficient. Restoration efforts are designed to achieve reduced erosion and improved water quality; sediment filtration; floodplain development; floodwater retention; groundwater recharge; stabilized stream banks; and/or habitat and water depth, duration, and temperature necessary for fish and waterfowl habitat, and biodiversity.

Vegetation restoration projects would reestablish an understory of forbs and perennial bunchgrasses that are less susceptible to fire than invasive annuals, such as cheatgrass. This would reduce the risk of catastrophic wildfire on rangelands, which might otherwise spread into riparian and wetland areas.

Restoring appropriate levels of forage production in uplands would disperse livestock and reduce the need for cattle to concentrate in the more productive riparian and wetland areas for sustenance. The promotion of upland plant community health can help promote the distribution of livestock which can decrease pressure and use of riparian areas. Additionally, upland plant community health can help reduce erosion, leading to decreased sediment loading in riparian areas.

Effects under Alternative A

Under Alternative A, riparian management actions would continue to reduce the potential for degradation of riparian wildlife habitat. The implementation of BMPs that address non-grazing impacts, such as water diversions, roads, and recreation, would avoid and mitigate many surface disturbances and erosion. Maintenance of healthy forests through pinyon-juniper removal or thinning would occur on a case-by-case basis. The BLM would continue to work towards meeting Rangeland Health Standards throughout the CCD.

Effects under Alternative B

Under Alternative B, a pinyon-juniper removal and thinning program would be initiated to aid in sagebrush restoration and improving woodland health. As many as 20,000 acres of pinyon-juniper woodlands would be converted to sagebrush habitats each year for the first decade, which will, reduce the overall coverage of pinyon-juniper woodlands. An additional 6,500 acres would be

thinned each year resulting in a less dense woodland stand, improved tree health, increased sunlight/water/available nutrients, and regrowth of understory grasses, forbs, and shrubs. Alternative B would maximize sustained yield of forest products and economic development, and would also allow salvage logging of burned stands. Alternative B would also limit stream crossings to minimize sedimentation.

Alternative B includes vegetation treatments for rangeland restoration, and aim to improve ecological site conditions, to benefit land health. Revegetation efforts would use plant species that have high success rates, not necessarily native species, promote maintenance of ecological integrity, and aim to restore depleted understory vegetation. All these approaches would benefit vegetation by maintaining and restoring its condition, more than current management. Alternative B would allow sagebrush removal when needed for mineral extraction or other purposes, which is less protective than approaches under the other action alternatives. This alternative lacks provisions to promote native plant use in rehabilitation and stabilization projects and to restrict grazing in riparian areas.

Alternative B and the other action alternatives would use appropriate control methods, including mechanical, biological and chemical to eradicate or control invasive, nonnative species and noxious weeds, and implement other policies to reduce the spread of noxious weeds.

Effects under Alternative C

Under Alternative C, a limited pinyon-juniper removal (as many as 3,500 acres per year) and thinning project (up to another 1,500 acres per year) would be initiated, to restore sagebrush ecosystems and woodland health (**Table 2-1**). Alternative C would manage vegetation with a focus on wildlife habitat, forest health and fuels reduction, would allow salvage logging only to protect public safety, and includes mitigation measures for conducting vegetation treatments. For rehabilitation projects, Alternative C promotes use of native plant material and restoration techniques to establish desired plant communities. Alternative C would limit woodcutting or vegetative removal in riparian areas. Conservation of vegetation resources would be greatest under this alternative.

Wildlife, livestock, or recreation implementation plans would consider impacts on riparian areas and meadows, and consider limits to livestock grazing in sensitive riparian areas. In attaining Proper Functioning Condition (PFC) the interim goal would be 85 percent (functioning at risk with an upward trend), progressing towards or attaining PFC, compared to 75 percent under Alternative B. Rangeland treatments are similar to Alternative B, but Alternative C does the most to promote revegetation with native species and to limit sagebrush removal.

Effects under Alternative D

Alternative D would require a comprehensive restoration strategy and a utilization plan for by products of pinyon-juniper treatments before any removal of this vegetation type. Alternative D would also manage for healthy and diverse forestlands, and consider impacts on riparian areas, as under Alternative C. PFC goals would be the same as Alternative C. This would protect against sagebrush removal in urban interface areas only. Alternative D would allow salvage logging for public safety and to meet demand for wood, and includes mitigation measures as under Alternative C.

Effects under Alternative E

Alternative E has a pinyon-juniper removal and thinning program to aid in sagebrush restoration. As many as 8,500 acres would be converted to sagebrush habitats each year and an additional 6,500 acres thinned each year, fewer than anticipated under Alternative B, but more than the other alternatives. Alternative E would also manage for healthy and diverse forestlands, consider impacts on riparian areas, and protect sagebrush from removal, as under Alternative C. PFC goals would be the same as Alternative C. Alternative E would allow salvage logging for public safety, forest health, and to meet demand for wood and includes mitigation measures as under Alternative C.

Vegetation: Effects from Fish and Wildlife Management*Effects Common to All Alternatives*

Habitat restoration actions would benefit upland and riparian vegetation that provides wildlife habitat. Improving aquatic habitats involves rehabilitating wetland and riparian vegetation to foster healthy aquatic communities by decreasing sedimentation, providing structural complexity, and restoring suitable water temperatures, canopy cover, and bank stabilization. Actions to minimize erosion and sedimentation would indirectly benefit riparian and wetland vegetation by reducing soil disturbance and increasing infiltration, leading to improved plant vigor and productivity.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Vegetation: Effects from Special Status Species Management*Effects Common to All Alternatives*

Special status species management across all alternatives would restrict or prevent certain activities within special status species habitat. Additional permitting requirements such as plant, Greater Sage-Grouse, bat, and raptor inventories would be required. Such actions to avoid impacts on listed or sensitive species or their habitat could directly affect implementation, effective placement, or timing of vegetation management treatments. As a result, certain management goals may be precluded, but wildlife habitat would be protected. Maintaining and improving special status species habitat would improve riparian and wetland areas that provide important resources for these species. Management aimed at maintaining and improving special status species habitat would directly impact vegetation by helping to achieve rangeland and forest health and wildlife habitat goals in these areas. Management of Lahontan cutthroat trout habitat could directly restrict certain vegetation treatments that would occur in adjacent riparian woodlands, such as soil disturbance or use of chemicals.

Impacts from special status species plant management would increase the need to monitor areas containing sensitive plant to determine health, disease, unauthorized harvesting, invasive plants, recreational impacts, and impacts associated with livestock grazing and climate change.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Vegetation: Effects from Wild Horse and Burro Management*Effects Common to All Alternatives*

Direct impacts on vegetation resulting from wild horse and burro management actions include browsing and trampling of vegetation, and compacting soil, which alter the amount, condition, production, and vigor of vegetation in grazed areas. Wild horses and burros directly impact riparian vegetation around watering locations by trampling and grazing plants, which reduces riparian species cover

and diversity, and may result in localized area of invasive plant dominance. Protection and development of seeps and development of alternative water sources mitigate impacts of wild horses on riparian and wetland habitat. Vegetation recovery on a burned area could be slowed or reduced by wild horses and burros.

Under all alternatives, the BLM would manage wild horses and burros in HMAs CCD with rangeland health evaluations to monitor vegetation health and density.

Effects under Alternative A

The BLM would manage wild horses and burros in HMAs as shown in **Table 2-I**. AMLs would be maintained at levels in keeping with the productivity of the habitat area. Periodic reductions in wild horse levels may be required. Lack of flexibility in current management may result in over-grazing by wild horses and burros.

Effects under Alternative B

Under Alternative B, through the rangeland health evaluation process, the adequacy of habitat components would be assessed to determine levels that could support healthy rangeland and healthy herds over the long term. Suitable, acceptable, marginal, and unsuitable habitat would be identified through a modified habitat evaluation process, and may lead to adjustments in AML or exclusions from AML due to water availability, sparse vegetation, or other factors. This alternative has an increased component of adaptive management relative to Alternative A. This would better protect rangeland vegetation.

Effects under Alternative C

Effects would be similar to those discussed under Alternative B.

Effects under Alternative D

Effects would be similar to those discussed under Alternative B.

Effects under Alternative E

Effects would be similar to those discussed under Alternative B.

Vegetation: Effects from Wildland Fire Ecology and Management

Effects Common to All Alternatives

Vegetation response to fire depends on the size, location, intensity, season, timing, and amount of precipitation, preexisting plant community condition, and the abundance of noxious and invasive weeds in the area. Fires have direct effects by changing the composition of the plant community, delaying plant succession, and removing woody vegetation and plant litter. Wildland fires may burn hot enough to kill soil organisms and root systems, resulting in diminished plant recruitment and growth rates. ESR treatments, such as seeding with native perennial species, would be implemented to restore degraded vegetation and

directly improve vegetation health in the long term. These treatments indirectly deter the spread of weeds and invasive species.

Wildland fires create an opportunity for noxious and invasive weeds to become established or spread by removing aboveground vegetation, leaving burned areas more susceptible to noxious and invasive weeds. Some species of noxious and invasive weeds respond well to post-fire conditions and out-compete native species. Firefighting equipment might also introduce or spread noxious and invasive weeds, disturb the soil surface and remove vegetation, creating an opportunity for noxious and invasive weeds to become established.

Fuels management actions would result in short-term direct loss of vegetation on a small scale. Projects would reestablish desirable vegetation communities, providing for healthy, diverse rangelands, riparian and wetland areas over the long term. These actions would allow fire to play its natural role more frequently and would reduce the likelihood of catastrophic wildfire. This would protect native vegetation in the long term.

Suppressing wildfire and creating fuel breaks would prevent catastrophic destruction of native vegetation and would preserve native vegetation and diversity and prevent noxious weed invasion in these areas over the long term. Surface disturbance resulting from fire line construction, use of heavy equipment, and other fire suppression activities would damage vegetation and accelerate soil erosion in localized areas. However, these areas would be rehabilitated to minimize long-term impacts.

Effects under Alternative A

Alternative A manages wildfires in Category A, B C, and D, each with target fire suppression goals to protect property and resources. Fire suppression would protect vegetation in areas threatened by fire, but can contribute to more damaging fires if dense understory vegetation builds up.

Effects under Alternative B

Alternative B would develop fire management plans to guide response to wildfire and prioritize suppression activities, and improve ESR. Alternative B would include provisions to prevent cheatgrass and other invasive species from dominating burned areas and altering the natural fire regime by re-establishing appropriate species/subspecies. This approach would benefit vegetation more than current management.

Effects under Alternative C

Management under Alternative C would be similar to Alternative B, with more focus on protecting sensitive biological, cultural, and other natural resources, and use of native species in revegetation. This alternative would do the most to protect vegetation from fire damage.

Effects under Alternative D

Management actions under Alternative D would be similar to those described under Alternative B, but would focus resources on the urban interface zone.

Effects under Alternative E

Effects would be similar to those discussed under Alternative B.

Vegetation: Effects from Cultural Resources Management

Effects Common to All Alternatives

In general, cultural resource management may place use restrictions or specific protection measures on areas containing upland, riparian and wetland vegetation. Protections to cultural resources would prevent direct disturbance and fragmentation of vegetated areas. These areas are small relative to the amount of vegetation in the planning area; therefore, impacts would be localized.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Vegetation: Effects from Paleontological Resources Management

Effects Common to All Alternatives

Conservation measures and law enforcement actions to protect paleontological resources would prevent direct disturbance to and degradation of vegetated habitat, while potentially impacting the ability to implement vegetation treatments in certain areas. These areas are small relative to the acres of vegetation; therefore, impacts would be localized.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Vegetation: Effects from Visual Resources Management

Effects Common to All Alternatives

Implementing VRM guidelines, particularly managing WSAs as Class I, would increase the difficulty of accomplishing vegetation management actions and may affect the dimensions and locations of vegetation treatments, because such vegetation treatments could change the visual character of vegetated areas. Class I and II guidelines would limit the scope of stand treatments or prescribed burning and would restrict the number, size, and location of treatments and prescriptions.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Vegetation: Effects from Forestry and Woodland Product Management

Effects Common to All Alternatives

The proposed vegetation management actions allow the utilization of vegetative products under all the alternatives for both personal use and resale (commercial). Products available for harvest include but are not limited to firewood, Christmas trees, posts, poles, lumber, wildings, cuttings, native seed, and pine nuts. Harvest would only be allowed on the maximum treatment acres proposed under each alternative with the exception of native seed. Native seed collections typically occur on rangeland sites and include harvest seed from grasses, forbs, and shrubs for subsequent seeding of fires or restoration sites. The issuance of these permits is dependent upon seed availability/viability and

site health, which varies significantly from year to year. Since the collection of native seed typically involves low-impact hand harvest, impacts on vegetation are very minimal.

The collection and removal of vegetative products may result in the introduction of nonnative species, damage to vegetation from vehicles and equipment, increased activity fuels (slash), creation of access roads if permittees drive off existing roads to collect products. These impacts are mostly associated with personal use activities that are not regularly monitored. All alternatives allow for the personal and commercial use of vegetative products, with the exception of commercial use of pine nuts.

Effects under Alternative A

Current management would continue under Alternative A, Wood product sales would be restricted within identified high erosion areas should ground cover be reduced more than 50 percent. Pinyon pine nut harvests for personal use would be allowed as many as 25 pounds without a permit. Commercial collection of pine nuts may be allowed with Field Manager approval and the issuance of a commercial permit for fair market value.

Effects under Alternative B

Alternative B and the other action alternatives would prohibit the harvest of live or dead/down cottonwood or aspen trees on personal-use firewood permits. This approach would benefit vegetation resources. Alternative B would also allow extraction of vegetative material for biomass facilities. Pinyon pine nut limits for personal use would be the same as Alternative A and commercial permits may be issued. The focus of Alternative B is opening forest products to development and utilization.

This alternative has the highest amount of vegetative product removal. The actual impacts of this removal will depend upon current and future markets. Vegetative product removal would be limited to the acres of treatment proposed under this alternative and these acres are based on sustained yield calculations of available woodland. Commercial permits would contain stipulations to protect the soil, water, and vegetation. With proper monitoring the effects of these activities are likely to be less than the effects described for dispersed personal use activities.

Effects under Alternative C

Alternative C management would be similar to Alternative B with a 10 lb. limit on pinyon nut harvests for personal use and no commercial permits would be issued. The focus of Alternative C is resource conservation. This would benefit vegetation resources more than current management or Alternative B.

Effects under Alternative D

Effects would be similar to those discussed under Alternative B with fewer acres available for product harvest.

Effects under Alternative E

Effects would be similar to those discussed under Alternative B with fewer acres available for product harvest.

Vegetation: Effects from Livestock Grazing Management*Effects Common to All Alternatives*

Ineffective livestock grazing management may harm vegetation by reducing its amount, condition, production, and vigor. Impacts from grazing are usually related to a long duration of use during the growing season, resulting in lower vigor of grazed species and a change in species composition. Overuse of riparian and wetland vegetation next to water sources, troughs, and stock reservoirs often cause soil disturbance and a loss of plant cover. Livestock directly impact riparian vegetation around watering locations by trampling and grazing plants, which reduces riparian species cover and diversity. Livestock may also contribute to the spread of weeds. Livestock grazing management can be used to provide positive impacts on rangeland, such as reducing fuel buildup.

Actions to improve rangeland health are designed to improve the health and diversity of native vegetation communities and to rehabilitate disturbed areas. Range improvement actions would directly help to increase native vegetation and subsequently decrease the number and extent of weed populations in the long term.

Collecting monitoring data would allow problems to be detected so that corrective action could be taken to improve rangelands and lower weed spread. Unhealthy rangelands have a higher abundance of cheatgrass and noxious weeds. Fire spread increases with the amount of cheatgrass and noxious weeds. Therefore, unhealthy rangelands increase the likelihood of large catastrophic fires that damage and remove species of native vegetation. Following catastrophic fire, burn areas are more susceptible to noxious weed invasion. As such, native vegetation and wildlife habitat would be protected by maintaining healthy rangelands. This would indirectly prevent noxious weed invasion.

All alternatives would comply with standards and guidelines for livestock grazing, and manage allotments toward meeting Rangeland Health Standards. All alternatives would rest burned areas from livestock grazing for a minimum of two growing seasons.

Effects under Alternative A

Under current management, existing range management programs and closures would continue (see **Table 2-1**). These programs promote rangeland health and make provisions to improve habitat for wildlife, but some lands do not meet rangeland health standards and also likely provide poor wildlife habitat due to loss of understory cover and forage.

Effects under Alternative B

Under Alternative B, there would be a modest increase in acreage unavailable to grazing, and increased focus on restoration. Effects would be similar to Alternative A.

Effects under Alternative C

Under Alternative C, grazing utilization levels (measured in AUMs) would be reduced to 27 percent of current levels. If the reduced utilization level did not improve the ecological condition of allotments prior to the next periodic review, further reductions could be made based on monitoring. These provisions would improve the health of vegetation in allotments that were not meeting Rangeland Health Standards due to overgrazing, and could reduce soil compaction, disturbance of sensitive riparian areas, or spread of noxious weeds.

Effects under Alternative D

Under Alternative D, grazing would continue to be managed at existing levels, with re-examination based on monitoring and land health assessments during a periodic review process. Effects would be similar to Alternative A.

Effects under Alternative E

Under Alternative E, grazing would continue to be managed at existing levels, with re-examination based on monitoring and land health assessments during a periodic review process. Effects would be similar to Alternative A.

Vegetation: Effects from Geology and Mineral Management*Effects Common to All Alternatives*

Impacts on riparian and wetland vegetation could result from fluid, leasable, and locatable mineral development and mineral material sales and disposal. Most minerals management impacts on vegetation are on the sagebrush and saltbush scrub communities, so impacts on forests and riparian and wetland vegetation are lessened. Direct impacts include removal or damage to vegetation due to excavation and toxic responses from chemical use in mineral extraction; indirect effects include increased exposure to dust associated with construction and use of access roads. Under all alternatives, BMPs would be implemented, and revegetation would be required, thus minimizing impacts. Unnecessary roads would be managed as closed to reduce fragmentation and to restore habitat. In addition, special status species habitat would be avoided, thus protecting some vegetated areas.

Effects under Alternative A

Alternative A opens approximately four million acres (**Table 2-1**) to leasing, and would close 839,100 acres to fluid mineral leasing, and 738,000 acres to nonenergy leasable minerals. Alternative A has the greatest likelihood to impact vegetation.

Effects under Alternative B

Compared to Alternative A, Alternative B would manage a similar number of acres as open to fluid mineral leasing, but would manage 2,120,200 acres as open with CSU stipulations and 404,600 acres as open with NSO stipulations. Due to these additional stipulations, Alternative B would result in fewer impacts on vegetation from mineral leasing.

Effects under Alternative C

Alternative C would open the fewest acres (**Table 2-1**) and would close the most acres to mineral development. Acreage open to mineral materials and nonenergy leasable minerals would be 55 percent less than under current management; acres open to fluid mineral leasing would be 31 percent less than current management. Alternative C would result in the fewest impacts on vegetation from mineral leasing.

Effects under Alternative D

Effects under Alternative D would be similar to those discussed under Alternative B.

Effects under Alternative E

Effects under Alternative E would be similar to those discussed under Alternative B.

Vegetation: Effects from Recreation and Visitor Services*Effects Common to All Alternatives*

Managing BLM-administered lands to provide dispersed recreation could impact rangeland, forest, and riparian vegetation directly through human trampling or removal of vegetation and indirectly through human disturbance, soil compaction, weed introduction or spread, and increased dust.

OHV use is the most damaging form of recreation, resulting direct damage or removal of vegetation, trampling and disturbance and indirect impacts on vegetation due to in-stream erosion, soil compaction, and potential for human-caused wildfire. OHV management actions that result in increased OHV use would result in localized impacts on forest resources. Impacts could include degradation of habitat or sedimentation of waterways. OHV activities in undisturbed and remote areas could distribute weed seeds into weed-free areas. These effects could decrease plant vigor and productivity and alter community plant composition.

All alternatives would provide a wide range of developed and dispersed recreation opportunities to meet projected recreation demand in the planning area. All alternatives would also manage recreation use on BLM-administered land to protect natural resources, provide for health and safety, and minimize conflicts among land uses.

Effects under Alternative A

Under this alternative the BLM would continue to manage 67,700 acres in the Walker Lake and Alpine SRMAs. Managing lands as SRMAs could encourage additional use of these lands and thus increase damage to soil and vegetation; however, by designating SRMAs, development and logging would be reduced in these areas. Under SRMAs, management actions can reduce the impacts of recreational activities, and adverse impacts can be monitored and addressed.

OHV use would be the most detrimental to vegetation under Alternative A. Most of the planning area (3,840,300 acres) would be open to OHV use with minimal limited (924,300 acres) and closed (31,800 acres) designated areas.

Effects under Alternative B

Under Alternative B, the BLM would manage 76,100 acres as SRMAs, 12 percent more than Alternative A. Alpine and Walker Lake SRMAs would be maintained but reduced in size, and four additional SRMAs would be designated, identifying recreation as the principal use of these lands. Managing lands as SRMAs could encourage additional use of these lands and thus increase soil compaction and dust, but would also protect lands from development. Alternative B would also establish 7 ERMA, which provide less funding for public access and improvements than SRMAs, and thus may have lower visitation.

Under Alternative B, the BLM would manage 95,300 acres as open to OHV use, 4,677,000 acres as limited, and 26,700 acres as closed. This alternative would reduce impacts from OHV use compared to current management, but less than the other action alternatives.

Effects under Alternative C

Under Alternative C, 74,700 acres would be designated as SRMA, 10 percent more than Alternative A. The Walker Lake SRMA would be maintained and the Alpine SRMA expanded, and one new SRMA would be established, Sand Mountain. Fourteen ERMA would also be established. OHV use would be the most restricted under this alternative, with 1,190,500 acres closed, 3,013,500 acres limited, and 1,300 acres open to OHV use. Alternative C would result in the fewest impacts on vegetation resources from recreation because management would minimize development of recreational facilities that attract visitors and would place the most limitations on OHV use.

Effects under Alternative D

Effects would be similar to those described under Alternative B, but Alternative D would be more effective at reducing impacts from OHV use by further restricting OHV permitted use areas, including use in important habitat areas. Under this alternative, the BLM would manage 30,600 acres as closed, 4,748,400 acres as limited, and 22,700 acres as open. Three new SRMAs would be designated, and one (Walker Lake) closed, for a total of 67,100 acres in SRMAs,

approximately the same as Alternative A. Four ERMA's would also be established, including one in the urban interface zone.

Effects under Alternative E

This alternative would designate four new SRMA's while reducing the size of Walker Lake for a total of 106,100 acres, 57 percent more than Alternative A. Fourteen ERMA's would also be established. Under this alternative, the BLM would manage 24,100 acres as closed, 4,717,300 acres as limited (including priority wildlife habitat areas), and 55,700 acres as open to OHV use. These closure levels and limitations are more protective of vegetation resources than Alternatives B, but less protective than Alternatives C or D. All the action alternatives are substantially more protective of vegetation from OHV impacts than current management.

Vegetation: Effects from Comprehensive Travel and Transportation Management

Effects Common to All Alternatives

Maintaining roads would allow access to riparian areas and forests for wildfire management and suppression, when necessary. This would protect native vegetation and would help achieve riparian and wetland rehabilitation goals. However, roads may facilitate the spread of noxious weeds into native vegetation. BMPs and mitigation measures to minimize this spread would indirectly help improve vegetation health and stand composition in the long term.

Road and trail construction could directly impact rangelands, forests, and riparian and wetland areas through vegetation removal and could cause indirect impacts through soil compaction, invasive and noxious weed spread, and dust proliferation. This could reduce plant diversity and vigor in the long term. Construction of new roads and trails through riparian areas can alter hydrologic function, which may lead to channelization, incision, and lateral erosion, which can result in loss of riparian vegetation.

Effects under Alternative A

Under Alternative A, there would be no change to the current acreage open to motorized and mechanized travel (see **Table 2-1**) or limited to existing routes. Alternative A would result the greatest impacts from road and trail construction, including vegetation removal, soil compaction, and increased dust. These activities would decrease vegetation health and vigor, alter stand composition, and lower habitat value. However, improved and increased access to stands would also facilitate implementation of vegetation treatments and allow for multiple uses.

Effects under Alternative B

Under Alternative B, over 3,500,000 additional acres (**Table 2-1**) would be limited to existing routes. The same acreage would be managed as closed to

motorized travel as under Alternative A. The increase in acres restricted to existing routes would provide more protection for vegetation resources from road impacts than under current management, while maintaining a focus on economic development.

Effects under Alternative C

Under Alternative C, an additional 1.5 million acres (**Table 2-1**) would be managed as closed to motorized travel and an additional 2 million acres limited to existing routes. The smallest acreage would remain open to motorized travel, resulting in the lowest level of impacts on vegetation, but also increased difficulty in accessing these resources for management or development.

Effects under Alternative D

Alternative D effects would be similar to those described under Alternative B, with fewer acres open to motorized and mechanized travel and more limited to existing routes.

Effects under Alternative E

Under Alternative E, effects would be similar to those described under Alternatives B and D.

Vegetation: Effects from Lands and Realty

Effects Common to All Alternatives

Land and realty management actions would result in direct effects, such as short-term surface disturbance and vegetation removal, and indirect effects such as increased susceptibility to noxious weed invasion or spread of existing weed patches. Disturbed areas would be reclaimed and seeded. Land sales could affect vegetation resources by causing habitat loss and changing the vegetative cover through urbanization or agricultural or industrial development.

Land disposals could affect vegetation through changes in vegetative cover caused by urbanization or agricultural or industrial development. Vegetation and wildlife habitat value would be given consideration in disposal and acquisition decisions. Impacts on rangeland, riparian, or forest vegetation would vary on a case-by-case basis, but impacts would be minimized because only lands with little resource value would be identified for disposal. Acquisition of rangelands, forests or riparian areas would provide additional opportunities to achieve vegetation management objectives.

Direct effects from location of ROWs include surface disturbance and removal of vegetation to construct facilities such as power transmission lines, pipelines, roads and communication facilities. ROWs can indirectly cause habitat alteration, soil compaction, noxious weed invasion, and increased dust. Most of the footprints are localized but ROWs are linear and may stretch for miles, resulting in fragmentation of vegetation communities. In the long term, this would lower vegetation health and vigor, alter stand composition, and lower

habitat value. Implementation of mitigation measures including requirements to reclaim and seed disturbed areas would reduce surface disturbance impacts.

Effects under Alternative A

Alternative A does not delineate additional ROW avoidance or exclusion areas. Existing ROW exclusion areas (**Table 2-1**) would continue current management. Habitat fragmentation, loss of vegetation, and weed spread would continue. Under this alternative, 179,700 acres of BLM-administered land would be identified for disposal. Disposal lands may enhance vegetation resources, if the disposal enables BLM is able to acquire other land to form contiguous habitat parcels.

Effects under Alternative B

Under Alternative B, over a million acres (**Table 2-1**) would be set aside as ROW avoidance areas. Current management includes no areas. ROW exclusion areas and lands identified for disposal would remain at similar levels to Alternative A. Under this Alternative, 273,500 acres of BLM-administered land would be identified for disposal. Overall, management under Alternative B would be more protective of vegetation than current management because of the establishment of avoidance areas.

Effects under Alternative C

Under Alternative C, 2,675,800 acres would be managed as ROW exclusion areas and over 369,000 acres (**Table 2-1**) as avoidance areas. In addition, no BLM-administered land would be identified for disposal under this alternative. This alternative would provide the most protection to vegetation from ROW development on BLM-administered land.

Effects under Alternative D

Impacts under Alternative D would be similar to Alternative B except more avoidance area acres would be designated (1,226,100 acres). This alternative would protect vegetation from ROW development more than current management but less than the other action alternatives.

Effects under Alternative E

Under Alternative E, the BLM would manage 605,900 acres as ROW exclusion areas and 1,448,200 acres as ROW avoidance areas. Acres identified for disposal would also increase.

Vegetation: Effects from Renewable Energy

Effects Common to All Alternatives

Direct impacts on vegetation could occur from renewable energy projects with issuance of ROWs, which require vegetation clearing and would disturb or destroy vegetation. Indirectly, ROWs may spread or introduce invasive and noxious weeds, thereby reducing rangeland or riparian habitat health and

diversity. However, BMPs, stipulations, and mitigation measures would be implemented. This would minimize impacts on vegetation.

Effects under Alternative A

Under current management, no avoidance areas for wind energy have been designated, and approximately 900,000 acres (**Table 2-1**) are variance areas for solar projects. Variance areas allow development, but require provisions to protect resources in the area. Outside variance areas, utility-scale solar energy development is not permitted. Alternative A would provide little protection to vegetation from renewable energy impacts.

Effects under Alternative B

Alternative B would designate approximately 775,000 acres as variance areas for solar energy development and 1,220,200 acres as avoidance areas for wind energy turbines or transmission lines. Designating avoidance areas would protect vegetation from disturbance and limit indirect effects, such as noxious weed invasion or spread caused by development. These provisions would provide more protection to vegetation in the designated areas than current management.

Effects under Alternative C

Renewable energy impacts on fish and wildlife would be reduced most under Alternative C due to the designation of approximately 2,073,200 acres as wind energy exclusion areas. Designating exclusion zones would protect against direct disturbance and limit indirect effects, such as noxious weed invasion, providing the greatest benefit to vegetation. Approximately 580,000 acres would be managed as variance areas for utility-scale solar development, preserving more acreage from large-scale solar projects.

Effects under Alternative D

Impacts under Alternative D would be similar to Alternative B.

Effects under Alternative E

Impacts under Alternative E include 629,900 acres of variance areas designated for utility-scale solar development, and 629,900 acres in wind energy exclusion areas. This alternative would protect vegetation more than current management or Alternatives B or D, but less than Alternative C.

Vegetation: Effects from Areas of Critical Environmental Concern

Effects Common to All Alternatives

Special management areas such as ACECs result in increased protection of vegetation resources, and long-term improvement or maintenance of habitat quality as a result of special management and use restrictions in these areas. ACEC management could benefit vegetation in forests, riparian and wetland areas, and rangelands by restricting development in these areas. However, establishment of ACECs could restrict vegetation management activities.

Effects under Alternative A

Under current management, the planning area includes six ACECs, the largest being the Stewart Valley Paleontological Area (**Table 2-1**), for a total of 21,800 acres. These areas restrict development to protect sensitive resources, and provide incidental protection to vegetation from loss or damage. Under this alternative, only 6 acres of riparian and wetland areas are protected in ACECs.

Effects under Alternative B

Under Alternative B, an additional nine ACECs would be established in the planning area, for a total of 371,170 acres, including 1,500 acres of riparian vegetation. Management of ACECs would enhance protection of vegetation resources from development in these areas.

Effects under Alternative C

Under Alternative C, an additional 18 ACECs would be established in the planning area, for a total of 786,270 acres, including 2,400 acres of riparian vegetation. This alternative would protect the largest amount of land in ACECs and includes ACECs for special status plant and wildlife species. Management of ACECs would enhance protection of vegetation resources from development in these areas.

Effects under Alternative D

Under Alternative D, 180,000 acres would be protected in a total of ten ACECs. This amount includes 800 acres of riparian vegetation. This alternative manages more acreage in ACECs than Alternative A, but fewer than Alternatives B or C. Management of ACECs would enhance protection of vegetation resources from development in these areas.

Effects under Alternative E

Under Alternative E, 82,770 acres would be protected in eight ACECs, including 300 acres of riparian vegetation. This alternative manages more acreage in ACECs than Alternative A, but fewer than the other action alternatives. Compared to Alternative A, management of ACECs would enhance protection of vegetation resources from development in newly designated ACECs.

Vegetation: Effects from Back Country Byways*Effects Common to All Alternatives*

Back country byways may attract more tourism to areas they access and could increase human use and degradation of nearby vegetated areas through impacts and the introduction and spread of invasive species. Such effects initially would be minor and localized but over time could expand.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Vegetation: Effects from National Trails

Effects Common to All Alternatives

Management actions for preserving national historic trails would provide vegetation protection through habitat preservation by restricting surface-disturbing and other disruptive activities within the protected zone of the trail.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Vegetation: Effects from Wild and Scenic Rivers

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under this alternative, eligible river corridors would be given protection either through continued interim protective management or the development of comprehensive river management plans. This would provide additional measures along the segments of the East Fork Carson River that would promote riparian health and hydrologic function.

Effects under Alternative B

There would be no objective to protect eligible river segments under Alternative B, and therefore no special protection to vegetation found in these segments.

Effects under Alternative C

Alternative C would maintain the free-flowing character of eligible river segments, and allow no activities within the river corridor that would alter the tentative classification of those river segments. These management actions would protect riparian and wetland vegetation found in these river segments, more than Alternatives A or B.

Effects under Alternative D

Management would be the same as under Alternative C.

Effects under Alternative E

Management would be the same as under Alternative C.

Vegetation: Effects from Wilderness Study Areas

Effects Common to All Alternatives

As protected areas, WSAs would prevent disturbance to native vegetation in certain riparian and wetland areas, forests and rangelands. Vegetation treatments in these areas would need to be evaluated for their impacts on wilderness characteristics. All alternatives would maintain the same acreage of WSAs (**Table 2-1**). Lands found to possess wilderness characteristics will be managed for wilderness values along with other uses, while applying management restrictions to reduce impacts on wilderness characteristics. No surface disturbance, permanent new development or ROWs would be allowed in these lands. These restrictions would benefit vegetation resources in the WSAs by reducing loss and fragmentation associated with development.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Vegetation: Effects from Back Country Wildlife Conservation Areas

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

No BCWCAs would be designated under this alternative.

Effects under Alternative B

No BCWCAs would be designated under this alternative.

Effects under Alternative C

Under Alternative C, 817,800 acres would be preserved as Back Country Wildlife Concentration Areas, with plans to safeguard habitat, allow only dispersed non-motorized recreation opportunities, and maintain the surface values of back country areas. This management program would benefit vegetation in these conservation areas by preserving native stands and limiting fragmentation and disturbance.

Effects under Alternative D

No BCWCAs would be designated under this alternative.

Effects under Alternative E

No BCWCAs would be designated under this alternative.

Vegetation: Effects from Tribal Interests

Effects Common to All Alternatives

Implementing management actions that protect Native American traditional use areas would help to protect vegetation in these areas. Consulting with tribes to identify culturally significant plants, important habitats, traditional use locations and practices would emphasize protection of natural resources, including riparian and wetland areas. This would indirectly limit disturbance to soils and riparian vegetation over the long term. Consultation could place higher treatment priority in areas not previously identified or could limit actions in planned treatment areas. Impacts are likely to be localized.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Vegetation: Effects from Public Health and Safety

Effects Common to All Alternatives

Existing solid and hazardous waste sites and illegal dump sites would be identified and remediated. Management actions to remediate contaminated sites would benefit vegetation, especially in riparian and wetland habitats. Other actions not impact vegetation.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Vegetation: Effects from Interpretation and Environmental Education

Effects Common to All Alternatives

Development of educational and interpretive opportunities to foster environmental literacy, stewardship, and awareness of BLM management strategies could benefit vegetation to the extent the public education and increases awareness of natural resources and reduces damage to sensitive riparian areas, forest resources, and sagebrush habitats.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Vegetation: Effects from Facilities and Transportation Maintenance*Effects Common to All Alternatives*

Development of tracks and facilities would damage and fragment vegetation in localized areas. Restrictions on locations of these facilities would protect vegetation in these areas. Impacts would be minor and localized.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Vegetation: Cumulative Impacts

Table 4-1 lists the reasonably foreseeable cumulative actions for the CCD. Large areas of sagebrush habitat throughout the planning area are experiencing active pinyon and juniper expansion. Due to a number of factors, including climate change, wildfires, and surface disturbance caused by multiple uses, tens of thousands of acres of cheatgrass have established and have spread in sagebrush habitats district-wide, creating a potential for habitat conversion following disturbance. Pinyon and juniper are expected to continue expanding into sagebrush communities. Under the alternatives, vegetation treatments, including manual, biological, and mechanical methods would continue in the foreseeable future for pinyon and juniper as well as non-native invasive weeds.

Regarding vegetation in riparian areas, the majority of riparian areas are not currently in proper functioning condition, and many assessments indicate downward trends due to ongoing disturbances, leading to declining conditions and health of riparian vegetation. Implementation of permit stipulations, BMPs, standard operating procedures, and mitigation measures under the alternatives would reduce impacts on vegetation in riparian areas and protect from overgrazing and disturbance. However, despite management under the alternatives,

riparian areas are expected to continue in a downward trend while invasive weeds increase in extent.

Invasive weeds are expected to continue spread into riparian woodlands and sagebrush communities, carried by wind, humans, machinery, and animals. The BLM currently manages weed infestations through integrated weed management, including biological, chemical, mechanical, and educational methods. Though the rate of spread may slow, noxious and invasive weeds are expected to continue to spread on all lands under the alternatives. Due to their ability to tolerate certain conditions, some species are expected to remain a serious long-term challenge in the planning area.

Increase in the extent of urban/wildland interface is expected to increase the loss and fragmentation of vegetation communities in these areas, and land developments, including oil and gas leasing, renewable energy, land disposals, roads, and infrastructure will continue to remove and fragment vegetation throughout CCD. Permit stipulations, BMPs, standard operating procedures, and mitigation measures under the alternatives that include requirements to rehabilitate or restore vegetation after disturbance would reduce impacts.

Grazing pressure on rangeland vegetation from wild horses and burros and livestock is anticipated to continue. Management efforts under the alternatives designed to achieve land health standards or reduced grazing of livestock and wild horses and burros could reduce the size and number of areas where concentrated grazing would occur, resulting in fewer areas vulnerable to erosion or weed spread.

Habitat restoration or improvement projects would improve health and diversity of vegetation. Use restrictions in priority wildlife and watersheds, WSAs, and ACECs would protect native plant communities by restricting activities in those areas.

4.3.5 Fish and Wildlife

Summary

Impacts on fish and wildlife resources from other management programs include loss or alteration of native habitats, decreased food and water availability and quality, increased habitat fragmentation, changes in habitat and species composition, interruption of travel corridors, and disruption of species behavior, leading to reduced reproductive fitness or increased susceptibility to predation, and direct mortality. Surface-disturbing actions that alter vegetation characteristics (e.g., structure, composition, and production) can affect habitat suitability for fish and wildlife, particularly where the disturbance removes or reduces cover and food resources. Even minor changes to vegetation communities can affect resident wildlife populations.

The direct and indirect impacts of management actions on fish and wildlife resources may vary widely, depending on factors such as the dynamics of the habitat (e.g., community type, size, shape, complexity, and condition), season, intensity, duration, frequency, and extent of the disturbance, rate and composition of vegetation recovery, change in vegetation structure, type of soils, topography and microsites, animal species present, and the ability of fish or wildlife species to recolonize a site following disturbance.

Alternative C would best manage habitat to maintain biological diversity of wildlife. Although Alternative B is the resource use alternative, it includes more proactive resource management and conservation measures for fish and wildlife than Alternative A or Alternative D. Management actions in the areas of environmental justice and socio-economic conditions would not affect fish and wildlife resources.

Methods of Analysis

Fish and wildlife health is directly related to the quantity and quality of available habitat, the degree to which habitat is fragmented, habitat protective measures, and use restrictions. Most resource management actions have an indirect effect on fish and wildlife. Impact analysis on fish and wildlife resources includes an assessment of whether each action would result in the possible destruction, degradation, or modification of habitat or could result in the improvement of terrestrial and aquatic habitat. Most of the actions are mitigation and protective measures intended to improve the health or habitat of wildlife populations. This impact analysis identifies both enhancing effects on a resource from a management action as well as those that could degrade a resource. The degree of impact attributed to any one management action or series of actions is influenced by the watershed, the timing and magnitude of an action or actions existing vegetation, and precipitation. Quantifying these impacts is difficult due to the lack of monitoring data for most species.

The health of fisheries is tied to the overall health and functional capabilities of riparian and wetland resources and watershed health. Any activities that affect the ecological condition of the watershed and its vegetative cover would directly or indirectly affect the aquatic environment. As riparian systems adjust in response to the removal of vegetation or changes in hydrologic conditions, the availability of habitats required to fulfill the life history requirements of fish populations might be affected.

Impacts on federally listed, proposed, candidate, state threatened or endangered, or BLM sensitive species are addressed in the Impacts on Special Status Species section.

Indicators

The following indicators were used to assess the degree of impacts on fish and wildlife:

- Loss, fragmentation, degradation, or restoration of habitat
- Disturbance or stress to animals

Nature and Type of Effects

The nature and type of effects vary by resource and alternative as described in the following sections.

Fish and Wildlife: Effects from Air Quality Management

Effects Common to All Alternatives

Air quality has limited direct and indirect effects on wildlife, limited to the impacts of dust, smoke or other air pollution on animal health or habitat quality. Since all the alternatives are designed to meet air quality standards, the impact on wildlife is expected to be minimal.

Fish and Wildlife: Effects from Climate Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under current management, there is no consideration of climate change impacts in project design and operations. Climate change would continue without a planned BLM response, which could decrease contiguity of habitat and change conditions, making habitat more suitable for some species, but less suitable for others.

Effects under Alternative B

Under Alternative B, climate change impacts would be considered in project approval and funding, and specialists would use adaptive management in considering climate change in project design and operation. Rapid Ecological Assessment would be employed to assess impacts of climate change and maintain connectivity. These approaches would increase the ability of BLM management to respond to climate change. Adaptive management for climate change would improve habitat for fish and wildlife species.

Effects under Alternative C

Effects under Alternative C would be the same as under Alternative B.

Effects under Alternative D

Effects under Alternative D would be the same as under Alternative B.

Effects under Alternative E

Effects under Alternative E would be the same as under Alternative B.

Fish and Wildlife: Effects from Soil Resources*Effects Common to All Alternatives*

Under all alternatives, implementing conservation measures to reduce or prevent erosion and other degradations to soil would benefit wildlife habitat. Furthermore, reducing or preventing sedimentation in watercourses can improve the health of aquatic and semi-aquatic populations.

Soil litter, maintaining appropriate vegetation, and good infiltration are important to land health and habitat quality. Implementation of BMPs and RAC Standards and Guidelines for soil-disturbing activities and application of reclamation measures will mitigate for soil disturbance and encourage healthy vegetation communities and wildlife habitats.

Effects under Alternative A

Alternative A limits OHV use to designated roads and trails in highly erosive soil areas. This approach provides protection for soils in these areas from OHVs, but does not pro-actively prevent erosion in other locations.

Effects under Alternative B

Alternative B would apply an erosion control plan to projects on slopes, would apply soil amendments to minimize soil disturbance, and apply a CSU stipulation on highly erosive soils. These management approaches would diminish erosion and soil damage and protect habitat more than current management,

Effects under Alternative C

Alternative C management actions that call for applying mulch to reduce biotic soil crust breakage should result in increased vegetation cover, more intact biotic soil crust, and increased litter compared to the other alternatives. As a result, the management approaches under Alternative C would diminish erosion and soil damage relative to Alternatives A and B and would protect habitat.

Effects under Alternative D

Impacts associated with Alternative D would be similar to those associated with Alternative C as vegetative cover would be improved by increasing litter, biotic soil crust and vegetation as appropriate for soil type. Alternative D would also emphasize use of deep-rooted plants to stabilize vegetation and improve the soil surface. Deep-rooted plants would provide more habitat cover and food for wildlife in the long term. Alternative D includes the most specific actions to reduce soil damage and protect habitat.

Effects under Alternative E

Effects under Alternative E would be similar to those described for Alternative D.

Fish and Wildlife: Effects from Water Resources*Effects Common to All Alternatives*

Effective watershed management results in the minimization of erosion, the maintenance of hydrologic flow, healthy vegetative communities, and high quality wildlife habitat.

Developing water sources may result in more available water for wildlife, as long as wildlife have access to the developments. Furthermore, developing water sources may lead to an increase in insect populations. If insect populations were to increase, birds, small mammals (e.g. bats), and reptiles could benefit as a result of more available forage; however, increases in insects could also result in more incidences of diseases such as West Nile virus. Development of water sources would require a construction phase during which short-term disturbance to wildlife and habitat would occur. All alternatives have the goals of improving water supply and maintaining water quality and floodplains in accordance with federal, state and local laws.

Effects under Alternative A

Alternative A limits BLM-authorized activities in degrading watersheds and specific portions of urban watersheds at the most immediate risk of degradation, and limits OHV use in riparian areas. These approaches protect wildlife water supply in these local areas, but provide limited oversight of watershed health and water quality on a regional scale.

Effects under Alternative B

In addition to the efforts under current management, Alternative B and the other action alternatives would establish a listing of priority watersheds and priority water supply areas based on presence of threatened and endangered species habitat (occupied and recovery areas), among other factors. Based upon the actions in Alternative B, this alternative will be more effective at managing water resources for wildlife than current management.

Effects under Alternative C

In addition to the approach under Alternative B, Alternative C would also use permitting, land acquisitions, and other realty actions to acquire minimum pool and in-stream flows or to gain access to water sources or developments. Alternative C would also establish priority watersheds and would apply management constraints for protection within these priority watersheds. Water sources would be developed with an emphasis on wildlife needs, increasing the quality of wildlife habitat on BLM-administered land.

Effects under Alternative D

Effects under Alternative D would be similar to those described for Alternative C.

Effects under Alternative E

Effects under Alternative E would be similar to those described for Alternative C.

Fish and Wildlife: Effects from Vegetation Resources

Effects Common to All Alternatives

Vegetation includes upland vegetation, noxious and invasive weeds, and riparian and wetland systems.

Range management actions to promote land health, such as seedings and land treatments, would occur under all alternatives. Land treatments would facilitate the maintenance of habitats in various stages of shrub or understory condition, which should result in increased species diversity. Rangeland health is discussed in more detail in the Livestock Grazing section.

Actions that would improve riparian and wetland PFC would occur under all alternatives. These actions are designed to increase the quantity and quality of riparian vegetation, thereby improving habitats for riparian- and wetland-dependent wildlife species.

The spread of noxious and invasive weeds decreases vegetative diversity and native vegetative production, thus diminishing the quantity and quality of habitat available for wildlife. Weeds out compete native species, in disturbed areas and can create monocultures that are more prone to wildfire. Weed treatments using integrated pest management would be applied under all alternatives. These treatments may use chemical, mechanical, or biological means to reduce competition and improve native species diversity. Although weed treatments generally improve habitat in the long-term, short-term disturbances would occur. Treatments, especially mechanical treatments, would cause disturbance and loss of cover, causing some species to temporarily avoid treated areas, and increasing erosion. Mechanical treatments may also cause mortality to small mammals and reptiles.

Effects under Alternative A

Under Alternative A, integrated pest management would continue to be used for weed control. Land health assessments would monitor the health of rangeland systems.

Under Alternative A, riparian management actions would continue to reduce the potential for degradation of riparian wildlife habitat. The implementation of BMPs that address non-grazing impacts, such as water diversions, roads, and recreation, would avoid and mitigate many surface disturbances and erosion. No pinyon-juniper removal would occur.

Effects under Alternative B

Under Alternative B, a pinyon-juniper removal and thinning program would be initiated to aid in sagebrush restoration. As many as 20,000 acres would be restored annually and an additional 6,500 acres thinned for 10 years. Following the removal program, additional thinning of woodlands will occur annually. Removing pinyon-juniper woodlands would benefit sagebrush-dependent wildlife species, while reducing habitat for species found in pinyon-juniper woodlands. Thinning of pinyon-juniper woodlands, however, may benefit species that utilize open stands of pinyon-juniper by increasing vegetative and structural diversity.

Alternative B would manage for healthy and diverse forestlands to maximize sustained yield of forest products and economic development, and would also allow for salvage logging of burned stands. Alternative B would also limit stream crossings to minimize sedimentation.

Alternative B includes vegetation treatments for rangeland restoration, and aim to maximize ecological site potential to establish desired future condition, to benefit land health. Revegetation efforts would use plant species that have high success rates, not necessarily native species, promote maintenance of ecological integrity, and aim to restore depleted understory vegetation. All these approaches would benefit fish and wildlife by maintaining and restoring habitat, more than current management. Alternative B would allow sagebrush removal when there is a resource or resource use of higher priority (such as mineral extraction), which is less protective than approaches under the other action alternatives. Alternative B lacks provisions to promote native plant use in rehabilitation and stabilization projects and to restrict grazing in riparian areas.

Alternative B and the other action alternatives would use appropriate control methods, including mechanical, biological and chemical to eradicate or control invasive, nonnative species and noxious weeds, and implement other policies to reduce the spread of noxious weeds. All these approaches would benefit fish and wildlife by maintaining and improving habitat, more than current management.

Effects under Alternative C

Under Alternative C, a limited pinyon-juniper removal (as many as 3,500 acres) and thinning project would be initiated, to restore sagebrush ecosystems (**Table 2-1**). These actions would benefit sagebrush-dependent wildlife species, while reducing habitat for species found in pinyon-juniper woodlands, compared to Alternative A. However, these impacts would benefit species found in pinyon-juniper woodlands more, and benefit sagebrush-obligate species less, than Alternative B, which includes a larger-scale program.

Alternative C would manage for healthy and diverse forestlands with a focus on wildlife habitat, forest health and fuels reduction, would allow salvage logging only to protect public safety, and includes mitigation measures for conducting forest and woodland treatments. For rehabilitation projects, Alternative C

promotes use of native plant material and restoration techniques to establish desired plant communities.

Alternative C would limit woodcutting or vegetative removal in riparian areas. Wildlife, livestock, or recreation implementation plans would consider impacts on riparian areas and meadows, and consider limits to livestock grazing in sensitive riparian areas. In attaining PFC, the interim goal would be 85 percent (functioning at risk with an upward trend), progressing towards or attaining PFC, compared to 75 percent under Alternative B.

Rangeland treatments are similar to Alternative B, but Alternative C does the most to promote revegetation with native species and to limit sagebrush removal. Because wildlife are more likely to use native plant assemblages as habitat, these policies would benefit wildlife more than other alternatives.

Effects under Alternative D

Alternative D would study pinyon-juniper removal but does not include a removal or thinning program. Under this Alternative, the BLM would engage interested parties to develop a restoration strategy that may include removal or thinning of pinyon-juniper in the future. Alternative D would also manage for healthy and diverse forestlands, and consider impacts on riparian areas, as under Alternative C. PFC goals would be the same as Alternative C but would protect against sagebrush removal in urban interface areas only.

Alternative D would allow salvage logging for public safety and to meet demand for wood and includes mitigation measures as under Alternative C.

Effects under Alternative E

Alternative E has a pinyon-juniper removal and thinning program to aid in sagebrush restoration. As many as 8,500 acres would be restored and an additional 6,500 acres thinned, less than anticipated under Alternative B, but more than the other alternatives. Implementing Alternative E could result in the conversion of fewer low-density pinyon-juniper areas to sagebrush than Alternative B, but more than Alternative C (on an annual basis). In regards to thinning dense pinyon-juniper woodlands, Alternative E would be the same as Alternative B, but Alternative E could result in thinning more acres of dense pinyon-juniper per year than Alternative C. Species that utilize pinyon-juniper woodlands, particularly open stands of pinyon-juniper, should benefit from the increased vegetative and structural diversity that should result from thinning dense pinyon-juniper stands, but overall the actions would provide most benefit to sagebrush-dependent species.

Alternative E would also manage for healthy and diverse forestlands, consider impacts on riparian areas, and protect sagebrush from removal, as under Alternative C. PFC goals would be the same as Alternative C. Alternative E would allow salvage logging for public safety, forest health, and to meet demand for wood, and includes mitigation measures as under Alternative C.

Fish and Wildlife: Effects from Fish and Wildlife Management

Effects Common to All Alternatives

Fish and wildlife resources would benefit from development of specific objectives and actions to protect and enhance habitat conditions. Restrictions on development would lessen disturbance to animals and degradation of habitat.

Actions common to all alternatives include modification of fences to facilitate wildlife passage and marking the structures to reduce collision risk. Water troughs for livestock will be modified to allow wildlife access and prevent trapping, and the BLM will coordinate with other agencies on mitigation measures for wildlife and wildlife habitat protection.

All alternatives would also implement timing restrictions and distance buffers, as appropriate, to minimize impacts on wildlife from activities during important life cycle periods (e.g., breeding or major migrations), and would support research efforts to promote proper and efficient management of fish and wildlife. Implementing management actions to restore or improve wildlife habitat would benefit wildlife populations and maintain diversity.

Effects under Alternative A

Current management is designed to manage wildlife habitat for a long-term goal of providing forage for reasonable numbers of big game. This management regime does not specifically protect non-game fish and wildlife resources.

Effects under Alternative B

Alternative B would also manage for key habitat integrity to support fish and wildlife populations, with an emphasis on priority species and habitats. The BLM would implement additional habitat improvement projects and remove undesirable nonnative aquatic species (such as bullfrogs) from sensitive breeding grounds.

The BLM would apply CSU stipulations to areas surrounding important aquatic habitat, and manage priority wildlife habitat as ROW avoidance areas. Management would mitigate disturbance from land use authorization activities on big game species including pronghorn, bighorn sheep, and mule deer, and avoid disturbance to nesting migratory birds and important migratory pathways. The BLM would inventory for bats before development near caves and restrict development within 0.25 mile of raptor nests.

Effects under Alternative C

Programs under Alternative C would be similar to Alternative B, with stronger protections for raptor nests, NSO instead of CSU stipulations for aquatic habitat areas, and ROW exclusion rather than avoidance areas.

Effects under Alternative D

Programs under Alternative D would be similar to Alternative B, but some policies would only apply within the urban interface zone.

Effects under Alternative E

Programs under Alternative E would be similar to Alternative B, but management would apply NSO stipulations as under Alternative C.

Fish and Wildlife: Effects from Special Status Species Management

Effects Common to All Alternatives

Maintaining or improving habitat for special status species would also benefit other wildlife dependent on similar habitat. In addition, all alternatives would maintain ACECs for protection of some special status species, which also protect other fish and wildlife. More details on ACECs are provided in the ACEC section. All the action alternatives provide management actions and development restrictions to protect Greater Sage-Grouse habitat; fish and wildlife habitat in those areas would also be protected from degradation or loss.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Fish and Wildlife: Effects from Wild Horse and Burro Management

Effects Common to All Alternatives

Wild horses and burros compete with wildlife for forage, water, and cover. They consume relatively large amounts of vegetation and water, and can also cause substantial impacts on riparian areas. Wild horses and burros also can trample avian nests located in low vegetation or on the ground. All alternatives identify the need to maintain AMLs within HMAs and would use the gather process as a tool to meet that need. Gathering would help prevent excess impacts from overpopulation of herds and help ensure adequate forage, water, and overall habitat condition for wildlife. Gathers can cause short-term stress and displacement of wildlife and result in the disruption of life-cycle behaviors; however, the timing of gathers can reduce these impacts on most species.

Habitat monitoring, for sustainability, would be undertaken under the action alternatives and may result in adjustment of AML. This would also help in maintaining healthy habitat for wildlife. Fewer horses on the landscape would result in fewer impacts on wildlife habitat.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Fish and Wildlife: Effects from Wildland Fire Ecology and Management

Effects Common to All Alternatives

Wildland fire could be beneficial or detrimental to wildlife and their habitats. Periodic fires may reduce dense understory and restore nutrients to soil. Fire may convert late-successional vegetation to earlier seral stage, increasing habitat and species diversity. However, fire can also result in the loss of habitat for species that prefer late-seral communities, increased potential for erosion, and increased sedimentation and water temperatures in aquatic habitats from removal of upland and riparian vegetation. Fire can also cause long-term alternations of habitat, particularly for sagebrush habitats (or other shrub habitats that experience less than 12 inches of precipitation per year), which are slow to recover from fire, and vulnerable to competition from invasive weeds, which results in a loss of forage and cover for sagebrush-dependent species. Direct mortality of wildlife can also occur from fires.

Under all alternatives, fuel treatments can aid in limiting the size of wildfires, thereby reducing the extent of impacts. ESR activities, such as erosion control measures and reseeded, performed following fires facilitate restoration of burned areas.

Fire suppression also has short-term, localized impacts on fish and wildlife habitats. The use of heavy equipment or hand tools for fire breaks removes or crushes vegetation and disturbs soil, increasing erosion and the risk of invasive species spread. Furthermore, heavy equipment can cause injury or direct mortality to less mobile or burrowing wildlife species. Also, human presence during fuel treatments or fire suppression could disturb species and cause them

to avoid the area. Fire suppression would contribute to minimization of fire size and potential spread into adjacent habitat areas.

Effects under Alternative A

Alternative A manages wildfires in Category A, B C, and D, each with target fire suppression goals to protect property and resources. Fire suppression would protect wildlife and fish habitat in areas threatened by fire, but can contribute to more damaging fires if dense understory vegetation builds up.

Effects under Alternative B

Under Alternative B, the BLM would develop fire management plans to guide response to wildfire and prioritize suppression activities, and improve ESR programs. Alternative B would include provisions to deter cheatgrass and other invasive species from dominating burned areas and altering the natural fire regime by re-establishing appropriate vegetative species. This approach would benefit wildlife habitat more than current management.

Effects under Alternative C

Management under Alternative C would be similar to Alternative B, with more focus on protecting sensitive biological, cultural, and other natural resources, and use of native species in revegetation. This alternative would do the most to protect wildlife habitat from fire damage.

Effects under Alternative D

Management under Alternative D would be similar to Alternative B, but management programs would focus on the urban interface zone.

Effects under Alternative E

Effects under Alternative E would be similar to those described for Alternative B.

Fish and Wildlife: Effects from Cultural Resources Management

Effects Common to All Alternatives

Management for cultural resources and protection of cultural ACECs would provide incidental protection of wildlife and fish habitat in areas that contain identified cultural resources through restriction of disturbance to cultural resource areas in order to minimize damage to artifacts, erosion, and vegetation loss.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Fish and Wildlife: Effects from Paleontological Resources Management

Effects Common to All Alternatives

Management for paleontological resources and protection of paleontological ACECs would provide incidental protection of wildlife and fish habitat through restriction of disturbance to paleontological resource areas in order to minimize vegetation loss and erosion. Promoting public visitation to areas of paleontological interest or importance could impact wildlife or wildlife habitat, depending on the numbers of visitors to areas. Wildlife could be disturbed or habitat may be trampled, and wildlife may avoid habitat in areas of high visitation, but these impacts would be minor and localized.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Fish and Wildlife: Effects from Visual Resources Management

Effects Common to All Alternatives

Impacts on fish and wildlife would vary, depending on the number of acres identified by VRM class. In general, management of Class I or II VRM designated areas would allow for fewer intrusions to the landscape, resulting in fewer impacts on wildlife habitat.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Fish and Wildlife: Effects from Caves and Cave Resource Management

Effects Common to All Alternatives

Under all alternatives, caves would be evaluated for their potential value as bat habitat. Caves with identified bat resources would be assessed and prioritized for public closure to protect bat habitat, minimize potential impacts on roosting bats, and prevent the spread of disease (such as White-nose syndrome, a fast-spreading fungal disease). Implementation of other measures or use restrictions to protect caves and cave resources would also serve to protect wildlife habitat and limit disturbance to bats. However, installation of bat gates could prevent other wildlife, including bighorn sheep, from using caves for refuges or for water sources. If a cave may provide an important water source for wildlife, a cave inventory should be conducted before installing bat gates.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Fish and Wildlife: Effects from Forestry and Woodland Product Management

Effects Common to All Alternatives

Harvesting of forest products could impact wildlife due to noise, surface disturbance and loss or fragmentation of habitat. Additionally, harvesting forest

products could result in the mortality of some wildlife species. These activities are relatively limited in the planning area and impacts to wildlife should be localized.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Fish and Wildlife: Effects from Livestock Grazing Management

Effects Common to All Alternatives

Livestock grazing may benefit wildlife habitat by maintaining grass and forb diversity and removing fire-prone understory vegetation, but may also be detrimental if excessive levels result in loss of cover and forage for wildlife. Overgrazing by livestock can also result in the elimination of bunchgrasses, which results in an increase in bare ground that favors the invasion of cheatgrass (Reisner et al. 2013). Overgrazing by livestock along riparian areas can result in the loss of streamside vegetation, increased sedimentation in the water, and increases in water temperature, which can have negative impacts on fish populations (Kauffman and Krueger 1984). Waste from cattle in waterbodies can result in a decrease in oxygen for fish. Furthermore, nitrites and ammonia from cattle urine and feces are chronically toxic to fish (Taylor et al. 1989).

All alternatives would comply with standards and guidelines for livestock grazing, and manage allotments toward meeting Rangeland Health Standards. Allotments meeting standards provide superior habitat for wildlife because they have healthier vegetation, more native species, and less soil damage. All alternatives would rest burned areas from livestock grazing for a minimum of two growing seasons, and do not allow livestock salting within 0.25 miles of a stream, meadow, or aspen area. New grazing fences would be built to comply with wildlife standards.

These actions would promote habitat conditions for healthy fish and wildlife populations, which is especially important during times when additional stressors (such as drought or fire) impact habitat.

Effects under Alternative A

Under current management, existing range management programs and closures would continue (see **Table 2-1**). These programs promote rangeland health and make provisions to improve habitat for wildlife, but some lands do not meet rangeland health standards and also likely provide poor wildlife habitat due to loss of understory cover and forage.

Effects under Alternative B

Under Alternative B, there would be an increased focus on restoration. Alternative B allows prescriptive grazing for vegetative management purposes as necessary. Acres available and unavailable to grazing would be similar to Alternative A.

Effects under Alternative C

Under Alternative C, grazing utilization levels would be reduced to 40 percent of current levels, resulting in two million acres less habitat available for livestock grazing (**Table 2-1**). Areas containing Greater Sage-Grouse priority or general habitat would not be available for grazing, which would result in more available forage for wildlife that utilize these areas. If the reduced utilization level did not improve the ecological condition of allotments prior to the next periodic review, further reductions could be made based on monitoring. These provisions would improve the health of allotments that were not meeting Rangeland Health Standards due to overgrazing, and could provide more cover for wildlife. Compared to Alternatives A and B, Alternative C would result in more available forage and cover for wildlife species.

Effects under Alternative D

Alternative D allows for prescriptive grazing only within the urban interface area. Under Alternative D, grazing would continue to be managed at existing levels, with re-examination based on monitoring and land health assessments during the periodic review process every 10 years or on a case-by-case basis. Effects would be similar to those described for Alternative B.

Effects under Alternative E

Under Alternative E, grazing would continue to be managed at existing levels, with re-examination based on monitoring and land health assessments during a periodic review process. Effects would be similar to those described for Alternative B.

Fish and Wildlife: Effects from Geology and Mineral Management*Effects Common to All Alternatives*

Impacts on wildlife and habitat from mineral exploration and development generally occur from surface disturbance causing loss and fragmentation of habitat, as well as disturbances to individuals from noise and activity associated with construction, and operation of facilities and roads. Occasionally there is direct mortality to wildlife from mineral exploration and development, though

mitigation measures are generally implemented to decrease the likelihood of mortality.

In some situations, surface water may also be affected. Identifying lands open, closed, or open with standard stipulations and or open with special stipulations would protect wildlife by either restricting mineral uses in areas or providing mitigation for adverse impacts. Generally, greater restriction on disturbance leads to less impact on wildlife and habitat.

All alternatives would make mineral resources (leasable, locatable, salable) available for extraction or development but with differing open acres, stipulations and conditions of approval to protect other resources. Development of new sites and associated impacts on wildlife would be analyzed under the NEPA, with mitigation and stipulations applied to reasonably protect affected resources. Reclamation or rehabilitation of mineral operations before closure would include recontouring, stabilization, revegetation and removal of facilities.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Mineral Materials

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under this alternative, 4,239,100 acres would remain open to mineral material disposal (**Table 2-1**). New proposed sites would be analyzed under site-specific NEPA analysis. Impacts on wildlife and habitat would be avoided or mitigated with applied terms or stipulations.

Mineral material sites would result in loss of habitat for wildlife and long-term disturbance (e.g., surface, noise, and activity) in the vicinity of the sites as long as they remain open and active. These disturbed areas can increase the risk of

invasive weed introduction and spread, while decreasing habitat quality. Sites that require new access roads would also result in loss and fragmentation of habitat. There is also the potential of direct mortality to wildlife as a result of activities at mineral material sites.

Effects under Alternative B

The BLM would manage 3,996,100 acres as open to mineral material disposal as Alternative A with standard authorization terms and stipulations. This alternative would seek to maximize and promote the supply of mineral materials. Wildlife and habitat would continue to be impacted (as described under Alternative A) due to the maximization of material sites. However, under all alternatives, weed stipulations and abatement would continue with the goal of reducing the extent and spread of noxious weeds, which would be a benefit to wildlife and wildlife habitat.

Effects under Alternative C

Under Alternative C, the BLM would manage 1,798,400 acres as open to mineral material disposal, a 58 percent decrease compared to current management (**Table 2-1**). The focus would be on developing the fewest number of material sites necessary while meeting demands. There would be fewer impacts on wildlife and their habitat under this alternative, due to fewer acres open to mineral material disposal, and fewer acres open with standard authorization terms and stipulations. The minimization of new material sites would also result in fewer impacts.

Effects under Alternative D

Management under this alternative would be the same as Alternative B, with the added provision to close facilities if they are incompatible with adjacent land uses within the urban interface.

Effects under Alternative E

Management under Alternative E would manage 3,024,600 acres as open to mineral material exploration and development, a 29 percent reduction from current management.

Fluid Minerals

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under this alternative, the BLM would manage 3,964,200 acres as open to leasing and 700 acres as open to leasing but with a NSO stipulation. Stipulations and conditions of approval would be applied to protect other resources, including fish and wildlife. Fluid mineral exploration and development would result in impacts on wildlife and habitat similar to mineral materials exploration and development. In addition to those impacts, the presence of structures such

as buildings or transmission lines can cause injury or death to avian species as well as providing artificial perching/hunting and nesting opportunity for raptors and ravens. Therefore, predation is unnaturally increased along these lines.

Effects under Alternative B

Under this alternative, the BLM would manage 4,034,700 acres as open to leasing and 404,600 acres as open to leasing but with a NSO stipulation, and 2,120,200 acres as open with a CSU stipulation. This alternative would open more acres to fluid mineral leasing and extraction than current management but would apply restrictive stipulations to large amounts. Impacts on wildlife and habitat would be as discussed under Alternative A, but would occur on fewer acres. NSO stipulations would protect fish and wildlife from all surface disturbance, though disturbance may still occur in the vicinity and noise associated with fluid mineral activities could result in impacts on wildlife. CSU stipulations provide protection from surface disturbance during season of use or sensitive periods (such as fawning). This alternative may reduce impacts on fish and wildlife compared to current management.

Effects under Alternative C

Under this alternative, the BLM would manage 2,721,500 acres as open to leasing with standard lease terms and stipulations, 1,039,200 acres as open to leasing with a NSO stipulation, and 1,242,800 acres with a CSU stipulation. Impacts on wildlife and habitat, as discussed in *Effects under Alternative A*, would be reduced under this alternative with greatly reduced acreage open to leasing compared to Alternative A, greater acreage with restrictive stipulations, and greater acreage closed to leasing. Furthermore, timing limitations will be implemented within big game kidding, lambing, and fawning areas to prevent negative impacts on these species during kidding, lambing, and fawning periods.

Effects under Alternative D

Under this alternative, the BLM would manage 4,066,200 acres as open to leasing, 864,800 acres as open to leasing with a NSO stipulation, and 2,071,400 acres under a CSU stipulation. The same timing limitations that would be applied to big game areas under Alternative C would be applied under this alternative. Impacts on wildlife and habitat would be similar to Alternative B, with reduced impacts on wildlife that utilize those acres with restrictive stipulations applied, which are greater than under current management.

Effects under Alternative E

Under this alternative, the BLM would manage 3,796,000 acres as open to leasing with 1,151,600 acres open to leasing with a NSO stipulation and 1,844,900 acres under a CSU stipulation. The same timing limitations that would be applied to big game area for Alternatives C and D would also be applied to this alternative. Impacts on wildlife and habitat would be similar to Alternative D, with reduced impacts on wildlife that utilize those acres with restrictive stipulations applied, which are greater than under current management.

Nonenergy Leasable and Locatable

Effects under Alternative A

Under this alternative, the BLM would manage 4,064,400 acres as open to leasing. Nonenergy leasable mineral exploration and development would result in impacts on wildlife and habitat similar to those from mineral materials exploration and development.

Under this alternative, 3,700 acres are petitioned for withdrawal. Locatable mineral exploration and development would result in impacts similar to those from mineral materials exploration and development. Impacts on wildlife and habitat would be as described above.

Effects under Alternative B

Under this alternative, the BLM would manage 3,821,300 acres as open to leasing, and 439,600 acres petitioned for withdrawal. Impacts on wildlife and habitat would be as described above. With reduced acreage open to mining compared to Alternative A, and more acreage petitioned for withdrawal, impacts on fish and wildlife would be reduced in the closed areas. Alternative B would also restrict nonenergy mineral leasing within Greater Sage-Grouse habitat, but only if it was determined that there would be adverse impacts on Greater Sage-Grouse or their habitat. This could benefit wildlife species that utilize Greater Sage-Grouse habitat. In other areas, impacts would remain the same as under Alternative A.

Effects under Alternative C

Under this alternative, the BLM would manage 1,842,400 acres as open to leasing, and 117,500 acres petitioned for withdrawal. Impacts on wildlife and habitat would be as described above. With reduced acreage open to mining compared to Alternatives A and B, and similar acreage petitioned for withdrawal as Alternative B impacts on fish and wildlife would be reduced in the closed areas, compared to current management. Alternative C would also close nonenergy mineral leasing within Greater Sage-Grouse habitat. Thus, this alternative would protect more wildlife habitat from mining impacts than Alternative A or B.

Effects under Alternative D

Under this alternative, impacts on wildlife and habitat from nonenergy leasable minerals would be similar to Alternative B. For locatable minerals, 440,800 acres would be petitioned for withdrawal. Impacts would be nearly the same as Alternative C.

Effects under Alternative E

Under this alternative, the BLM would manage 3,017,400 acres as open to nonenergy leasable mineral leasing, and 470,600 acres petitioned for withdrawal from locatable mineral entry. With reduced acreage open to mining compared to Alternatives A, B, and D, and increased acreage petitioned for withdrawal

compared to the other alternatives, impacts on fish and wildlife would be reduced under this alternative. Leasing and disposal would also be restricted within Greater Sage-Grouse habitat, as under Alternative C. Thus, this alternative would protect more wildlife habitat from locatable mining impacts than the other alternatives, and would allow impacts from nonenergy leasable minerals on fewer acres than Alternatives A, B, or D, but more than Alternative C.

Fish and Wildlife: Effects from Recreation and Visitor Services

Effects Common to All Alternatives

Direct impacts from recreation management actions include loss or modification of habitat from constructing recreational facilities, including roads.

Recreation management actions that result in increased human presence (activities such as hiking, biking, camping, fishing, hunting, and sightseeing) would cause localized disturbance impacts on wildlife and fish species. More specifically, increased human-wildlife interaction resulting from recreation activities could cause animals to alter behaviors, home ranges, and habitat use and to become physiologically stressed. Commercial, competitive, and group recreational activities could have greater impacts, but effects would be short-term, localized, and minimized through use restrictions and mitigation measures.

OHV use is the most damaging form of recreation to fish and wildlife, as a result of habitat trampling and disturbance. OHV management actions that result in increased OHV use would cause localized impacts on wildlife and fish species. Impacts could include stress and displacement of wildlife, and degradation of habitat, introduction and spread of invasive species or sedimentation of waterways. OHV use can alter the seasonal and habitat use patterns of many wildlife species. All alternatives would provide a wide range of developed and dispersed recreation opportunities to meet projected recreation demand in the planning area. All alternatives would also manage recreation use on BLM-administered land to protect natural resources, provide for health and safety, and minimize conflicts among land uses. The BLM strives to increase public awareness of land stewardship through interpretation and education.

Effects under Alternative A

Under this alternative the BLM would continue to manage 67,700 acres in the Walker Lake and Alpine SRMAs. Managing lands as SRMAs could encourage additional use of these lands and thus increase disturbances to wildlife; however, by designating SRMAs, disruption of other wildlife areas may be reduced by focusing recreationalists in specific areas. Under SRMAs, management actions can reduce the impacts of recreational activities, and adverse impacts can be monitored and addressed.

OHV use would be the most detrimental to wildlife under Alternative A. Most of the planning area (3,840,300 acres) would be managed as open to OHV use with minimal limited (924,300 acres) and closed (31,800 acres) designated areas.

Effects under Alternative B

Under Alternative B, the BLM would manage 76,100 acres as SRMAs, 12 percent more than Alternative A. Alpine and Walker Lake SRMAs would be maintained but reduced in size, and four additional SRMAs would be designated, identifying recreation as the principal use of these lands. Managing lands as SRMAs could encourage additional use of these lands and thus increase the level of disturbances to wildlife in these areas. Alternative B would also establish 7 ERMAs, which provide less funding for public access and improvements than SRMAs, and thus may have less visitation and fewer impacts on fish and wildlife populations.

Under Alternative B, the BLM would manage 95,300 acres as open to OHV use, a 98 percent reduction from Alternative A, with 4,677,000 acres limited and 26,700 acres closed. Areas that would be managed as closed to OHV use include priority wildlife habitat areas. This alternative would reduce impacts from OHV use compared to current management, but less than the other action alternatives.

Effects under Alternative C

Under Alternative C, 74,700 acres would be designated as SRMAs, a 10 percent increase over Alternative A. The Walker Lake SRMA would be maintained and the Alpine SRMA expanded, and one new SRMA, Sand Mountain, would be established. The BLM would also establish 14 ERMAs. OHV use would be the most restricted under this alternative, with 1,190,500 acres closed, 3,013,500 acres limited, and only 1,300 acres open to OHV use. Alternative C would minimize development of recreational facilities that attract visitors and would place the most limitations on OHV use, resulting in the fewest impacts on wildlife resources.

Effects under Alternative D

Effects would be similar to those described under Alternative B, but Alternative D would be more effective at reducing impacts from OHV use by further restricting OHV permitted use areas, including use in important habitat areas. Under this alternative, the BLM would manage 30,600 acres as closed, 4,748,400 acres as limited (including priority wildlife habitat areas), and 22,700 acres as open. Three new SRMAs would be designated, and one (Walker Lake) closed, for a total of 67,100 acres in SRMAs, approximately the same as Alternative A. Four ERMAs would also be established, including one in the urban interface zone.

Effects under Alternative E

This alternative would designate four new SRMAs while reducing the size of the Walker Creek SRMA, for a total of 106,100 acres, a 57 percent increase from

Alternative A. Impacts on fish and wildlife in SRMAs may be increased by human visitation; however, SRMAs may serve to concentrate recreation away from other areas. Fourteen ERMAs would also be established. Under this alternative, the BLM would manage 24,100 acres as closed, 4,717,300 acres as limited (including priority wildlife habitat areas), and 55,700 acres as open to OHV use. These closure levels and limitations are more protective of wildlife than Alternatives B, but less protective than Alternatives C or D. All the action alternatives are far more protective of wildlife from OHV impacts than current management.

Fish and Wildlife: Effects from Comprehensive Travel and Transportation Management

Effects Common to All Alternatives

Under all alternatives, roads could decrease wildlife habitat quality and quantity. Roads and trails can result in an increase in invasive plant species, an increase in human-wildlife interactions, fragment habitats, and reduce wildlife refugia. Motorized vehicle use and associated human uses can degrade wildlife habitats from surface disturbance, alter wildlife foraging, reproductive, and movement behaviors, cause direct mortality from collisions, and displace and stress animals. Flooding and erosion from poorly maintained roads and trails can degrade surrounding aquatic habitats. Species such as big game that have large home ranges, follow distinct migration patterns, or are wary of humans are affected the most by roads.

Effects under Alternative A

Under Alternative A, there would be no change to current acreage open to motorized and mechanized travel (see **Table 2-1**) or limited to existing routes. The impacts described above would continue.

Effects under Alternative B

Under Alternative B, over 3,500,000 additional acres (**Table 2-1**) would be limited to existing routes. The same acreage would be managed as closed to motorized travel as under Alternative A. The increase in acres restricted to existing routes would provide more protection for fish and wildlife from road impacts than under current management.

Effects under Alternative C

Under Alternative C, approximately an additional 1.5 million acres (**Table 2-1**) would be managed as closed to motorized travel and an additional 2 million acres limited to existing routes. The smallest amount of acreage would remain open to motorized travel, resulting in the highest level of protection to fish and wildlife species from motorized travel impacts.

Effects under Alternative D

Alternative D management would be similar to Alternative B, with fewer acres open to motorized and mechanized travel and more limited to existing routes.

Effects under Alternative E

Under Alternative E, effects would be similar to those under Alternatives B and D.

Fish and Wildlife: Effects from Lands and Realty*Effects Common to All Alternatives*

Impacts on fish and wildlife from lands and realty management include habitat loss, fragmentation, and degradation; disturbance to species; direct mortality to species; and loss of species diversity from ROW development and other permitted facilities. Power lines, pipelines and road increase the density of human presence which would increase stress on wildlife during breeding, migration, and wintering periods. Mitigation may limit the extent of these impacts. Lands and realty management may also benefit fish and wildlife species by acquiring sensitive habitat and reducing the checkerboard pattern of public lands ownership and the size of publicly owned blocks of land. Larger blocks of contiguous lands allow for consistent management and increase habitat quality and allow for restoration of degraded habitat on acquired lands.

Under all alternatives, BLM will continue to manage authorized ROWs, including 440,000 acres within utility corridors, will encourage new transmission corridors and facilities (60 kilovolts or larger) proposed on BLM-administered lands to utilize existing corridors and underground components in visually sensitive areas and will consider natural, visual, and cultural resources, and wildlife habitat in analyzing utility proposals.

Effects under Alternative A

Alternative A does not delineate additional ROW avoidance or exclusion areas. Existing ROW exclusion areas (**Table 2-1**) would continue under current management. Important wildlife habitat areas would not be protected from ROW development, increasing the likelihood of disturbance and other impacts mentioned above. Habitat fragmentation would continue affecting species that need large areas of contiguous habitat to sustain populations. Under this alternative, 179,700 acres of BLM-administered land would be identified for disposal. Disposal lands may benefit wildlife if BLM is able to acquire other land to form contiguous habitat parcels, or may harm wildlife if the disposal moves the land to a less protective management regime.

Effects under Alternative B

Under Alternative B, over a million acres (**Table 2-1**) would be set aside as ROW avoidance areas, including implementation of mitigation measures to avoid or reduce impacts to wildlife or habitat. Current management includes no avoidance areas. ROW exclusion areas and lands identified for disposal would remain at similar levels to Alternative A. Under this alternative, 273,500 acres of BLM-administered land would be identified for disposal. Overall, management

under Alternative B would be more protective of wildlife than current management because of the establishment of avoidance areas.

Effects under Alternative C

Under Alternative C, 2,675,800 acres would be managed as ROW exclusion areas and over 369,000 acres (**Table 2-1**) as avoidance areas. In addition, no BLM-administered land would be identified for disposal under this alternative. This alternative would provide the most protection to fish and wildlife habitat from ROW development on BLM-administered land.

Effects under Alternative D

The impacts on wildlife under Alternative D would be similar to Alternative B except more avoidance area acres would be designated (1,226,100 acres). This alternative would protect wildlife habitat from ROW development more than current management but less than the other action alternatives.

Effects under Alternative E

Under Alternative E, the BLM would manage 605,900 acres as ROW exclusion areas and 1,448,200 acres as ROW avoidance areas. Acres identified for disposal would also increase to 267,200. Wildlife in ROW exclusion and avoidance areas would be protected from habitat degradation and other impacts, while wildlife on lands identified for disposal might face increased impacts, depending on the purpose of the disposal.

Fish and Wildlife: Effects from Renewable Energy

Effects Common to All Alternatives

Renewable energy development could impact wildlife by removing vegetation for construction of power lines, roads, communication sites and other facilities. Human disturbances from construction and operation of facilities, including noise, movement, and vibrations, could alter wildlife behavior within the vicinity of the facilities. Wind turbines cause injury and mortality to raptors, bats, and migratory birds that collide with them. In summary, impacts on wildlife from renewable energy projects include direct mortality, habitat fragmentation, habitat degradation and loss, and the alteration of normal behavior. BMPs, stipulations, and mitigation measures applied as part of these projects would limit impacts to some degree.

Effects under Alternative A

Under current management, no avoidance areas for wind energy have been designated, and approximately 900,000 acres (**Table 2-1**) are variance areas for solar projects. Variance areas allow development, but require provisions to protect resources in the area. Outside variance areas, utility-scale solar is not permitted.

Effects under Alternative B

Alternative B would designate approximately 775,000 acres as variance areas for solar development, and 1,220,200 acres as avoidance areas for wind energy turbines or transmission lines. These provisions would protect wildlife in the designated areas more than current management.

Effects under Alternative C

Renewable energy impacts on fish and wildlife would be reduced most under Alternative C due to 2,073,200 acres being managed as ROW exclusion for wind development. Approximately 580,000 acres would be variance areas for utility-scale solar, preserving more acreage from large-scale solar projects than Alternative A.

Effects under Alternative D

Impacts under Alternative D would be similar to Alternative B.

Effects under Alternative E

Impacts under Alternative E include 629,900 acres of variance areas designated for utility-scale solar, and 956,900 acres in wind energy avoidance areas. This alternative would protect fish and wildlife populations more than current management or Alternatives B or D, but less than Alternative C.

Fish and Wildlife: Effects from Areas of Critical Environmental Concern*Effects Common to All Alternatives*

Generally, special management areas such as ACECs result in increased protection of fish and wildlife, and long-term improvement or maintenance of habitat quality as a result of special management and use restrictions in these areas. Under all alternatives, species would receive some protection via BLM compliance with ESA and Section 7 consultation. While actions that “adversely affect” the species may be permitted by the BLM and USFWS, mitigation and conservation measures would be incorporated into any take permit issued by the USFWS in order to reduce the amount of take.

Effects under Alternative A

Under current management, the planning area includes six ACECs, the largest being the Stewart Valley Paleontological Area (**Table 2-1**), for a total of 21,800 acres. These areas restrict development to protect sensitive resources, and provide incidental protection to fish and wildlife habitat from loss or damage.

Effects under Alternative B

Under Alternative B, an additional nine ACECs would be established in the planning area, for a total of 371,170 acres. Management of ACECs would also enhance protection of fish and wildlife species from development in these areas.

Effects under Alternative C

Under Alternative C, an additional 18 ACECs would be established in the planning area, for a total of 786,270 acres. This alternative would protect the largest amount of land in ACECs and includes ACECs for botanical species and for Greater Sage-Grouse. Management of ACECs would also enhance protection of fish and wildlife species from development in these areas.

Effects under Alternative D

Under Alternative D, 180,000 acres would be protected in a total of ten ACECs. This alternative manages more acreage in ACECs than Alternative A, but less than Alternatives B or C. Management of ACECs would also enhance protection of fish and wildlife species from development in these areas.

Effects under Alternative E

Under Alternative E, 82,770 acres would be protected in eight ACECs. This alternative manages more acreage in ACECs than Alternative A, but less than the other action alternatives. Management of ACECs would also enhance protection of fish and wildlife species from development in these newly designated ACECs.

Fish and Wildlife: Effects from Back Country Byways

Effects Common to All Alternatives

Fish and wildlife resources may be displaced and habitat fragmented by development of Back Country Byways in their immediate environments. Wildlife could be disturbed by increased human presence during sensitive seasonal periods, such as breeding, nesting, and migration. These adverse impacts would be localized, and the public educational benefit of increased wildlife awareness might indirectly benefit wildlife species.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Fish and Wildlife: Effects from National Trails

Effects Common to All Alternatives

Management actions for preserving national historic trails would provide wildlife and fish protection through habitat preservation by restricting surface-disturbing and other disruptive activities within the protected zone of the trail. However, preserving national historic trails may limit or prohibit land treatments and habitat restoration projects that could benefit wildlife.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Fish and Wildlife: Effects from Wild and Scenic Rivers

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under this alternative, eligible river corridors would be given protection either through continued interim protective management or the development of comprehensive river management plans. This would provide additional measures along the segments of the East Fork Carson River that would promote fish and wildlife habitat health and hydrologic function.

Effects under Alternative B

There would be no objective to protect eligible river segments under Alternative B, and therefore no special protection to fish and wildlife species found in these segments.

Effects under Alternative C

Alternative C would maintain the free-flowing character of eligible river segments, and allow no activities within the river corridor that would alter the tentative classification of those river segments. These management actions would protect fish and wildlife populations found in these river segments, more than Alternatives A or B.

Effects under Alternative D

Effects under Alternative D would be the same as those described for Alternative C.

Effects under Alternative E

Effects under Alternative E would be the same as those described for Alternative C.

Fish and Wildlife: Effects from Wilderness Study Areas

Effects Common to All Alternatives

All alternatives would maintain the same acreage of WSAs (**Table 2-1**). Lands found to possess wilderness characteristics will be managed for wilderness values along with other uses, while applying management restrictions to reduce impacts on wilderness characteristics. No surface disturbance, permanent new development or ROWs would be allowed in these lands. These restrictions would benefit fish and wildlife populations found in the WSAs by limiting disturbance to animals and reducing habitat loss and fragmentation associated with development.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Fish and Wildlife: Effects from Back Country Wildlife Conservation Areas

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

No BCWCAs would be designated under this alternative.

Effects under Alternative B

No BCWCAs would be designated under this alternative.

Effects under Alternative C

Under Alternative C, 817,800 acres would be preserved as BCWCAs, with plans to safeguard fish and wildlife habitat, allow only dispersed non-motorized recreation opportunities, and maintain the surface values of back country areas. This management program would benefit fish and wildlife species found in these conservation areas by preserving habitat quality and limiting fragmentation and disturbance.

Effects under Alternative D

No BCWCAs would be designated under this alternative.

Effects under Alternative E

No BCWCAs would be designated under this alternative.

Fish and Wildlife: Effects from Tribal Interests

Effects Common to All Alternatives

Implementing management actions that protect Native American traditional use areas for religious and other traditional practices would help to protect and sustain fish and wildlife habitat. Tribal consultation is not likely to adversely impact fish and wildlife resources.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Fish and Wildlife: Effects from Public Health and Safety

Effects Common to All Alternatives

Management actions to provide for public safety could also benefit wildlife. Closing abandoned mines could cause loss of bat habitat; however, if the mines are closed in a manner that allows access for bats, these impacts would be avoided. Installing fences around and bat gates within abandoned mines would prevent injury to the public as well as reduce disturbance to bats, especially during the critical hibernation or maternity periods. Furthermore, fencing may

reduce the potential for wildlife mortality by keeping wildlife away from dangerous shafts.

Actions to remediate contaminated sites would benefit wildlife habitats and populations, especially those that depend on riparian and wetland habitats. Reducing contaminants in the environment reduces the potential for ingestion by animals and bioconcentration via the food chain.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Fish and Wildlife: Effects from Facilities and Transportation Maintenance

Effects Common to All Alternatives

Development of tracks and facilities would damage and fragment wildlife habitat in localized areas. Restrictions on locations of these facilities would protect wildlife and fish habitat in other areas. Impacts would be minor and localized.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Fish and Wildlife: Cumulative Impacts

Table 4-1 lists the reasonably foreseeable cumulative actions for the CCD. Anticipated increases in mineral exploration and extraction, lands and realty

actions, renewable energy development, OHV use and recreational activities under the alternatives would increase disturbance and habitat fragmentation for fish and wildlife species. Pinyon and juniper encroachment in sagebrush areas will continue to degrade habitat for sagebrush-dependent species while expanding habitat for pinyon-juniper dependent species. Factors, including drought (climate change), wildfires, and surface disturbance caused by multiple uses, have contributed to conversion of tens of thousands of acres of native habitat to cheatgrass, impacting wildlife habitat and sustainability. Planned fuel breaks and prescribed burns under the alternatives would reduce the chance of large-scale fire and the likelihood of establishment and spread of invasive weeds. Some land uses would be prohibited or restricted, to varying degrees, in priority habitat, special status species habitat, ACECs, and priority watersheds under the alternatives, reducing disturbance and increasing habitat restoration. In addition, all alternatives would implement BMPs, standard operating procedures, and required mitigation measures and permit stipulations to minimize impacts on wildlife and its habitat.

4.3.6 Special Status Species

Summary

Impacts on special status fish, wildlife, and plant resources in the planning area include loss or alteration of native habitats, increased habitat fragmentation, changes in habitat and species composition, disruption of species behavior leading to reduced reproductive fitness, and direct mortality. In general, impacts on fauna would be similar to those discussed in the Fish and Wildlife section, but may be more severe on special status species because of their rarity.

The direct and indirect impacts of management actions on special status species may vary widely, depending on factors such as the dynamics of the habitat (e.g., community type, size, shape, complexity, and condition), season, intensity, duration, frequency, and extent of the disturbance, rate of vegetation recovery, change in vegetation structure, type of soils, topography and microsites, species present, and the ability of species to recolonize a site following disturbance.

Alternative C would best manage habitat to maintain biological diversity. Although Alternative B is the resource use alternative, it includes more proactive resource management and conservation measures for special status species than Alternatives A or D.

Methods of Analysis

Methods and Assumptions

The following methods and assumptions were used to assess the impacts on special status species:

- The health of special status species is directly related to the overall health and abundance of their habitat. Special status plant health is

also directly related to an abundance of individual plants as well as the condition and abundance of their habitat. Many resource management actions have an effect on special status species. Impact analysis on special status species included an assessment of whether each action would result in the possible destruction, degradation, or modification of habitat, as well as impacts that could improve terrestrial and aquatic habitat for wildlife and plants. The evaluations are confined to the actions that have direct, immediate, and more important effects on the planning area, instead of identifying and evaluating all possible interactions and cause-effect relationships, even those that are minor.

- Some impacts will be direct, while others will be indirect and affect special status species and their habitats through a change in another resource. Some impacts may be direct for special status plants but indirect for special status wildlife that use the area. Direct impacts on special status species include disruption, potential trampling; and direct mortality.
- Indirect impacts include loss of habitat suitable for colonization and/or alteration of ecological natural processes that create and maintain habitat over time due to surface disturbance; introduction of noxious weeds; increased noise; and general loss of habitat due to surface occupancy or surface compaction. Potential indirect impacts include those that cannot be absolutely linked to one action, such as decreased plant health from reduced air or water quality.
- Most of the actions are mitigation and protective measures intended to improve health or habitat of special status plant and wildlife populations. Quantifying these impacts is difficult due to the lack of monitoring data for most species. In absence of quantitative data, best professional judgment was used.
- The health of fisheries is directly related to the overall health and functional capabilities of riparian and wetland resources, which in turn are a reflection of watershed health. Any activities that affect the ecological condition of the watershed and its vegetative cover would directly or indirectly affect the aquatic environment. The degree of impact attributed to any one disturbance or series of disturbances is influenced by location within the watershed, time and degree of disturbance, existing vegetation, and precipitation. As riparian systems adjust in response to the removal of vegetation or changes in hydrologic conditions, the availability of habitats required to fulfill the life history requirements of fish populations might be affected.

- Only impacts on federally listed, proposed, or candidate, state threatened or endangered, or BLM sensitive species are discussed in this section.

Indicators

The following indicators were used to assess the degree of impacts on special status species:

- Loss, fragmentation, degradation or restoration of habitat
- Disturbance or stress to individuals

Nature and Type of Effects

Potential impacts to special status species within the planning area are discussed below with an additional section that specifically addresses impacts on Greater Sage-Grouse under the various alternatives.

Special Status Species: Effects from Air Quality Management

Effects Common to All Alternatives

Air quality has limited direct and indirect effects on special status plants or wildlife, limited to the impacts of dust, smoke or other air pollution on health or habitat quality. Since all the alternatives are designed to meet air quality standards, including abatement of dust deposition on vegetation, the impact on special status species is expected to be minimal.

Special Status Species: Effects from Climate Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under current management, there is limited consideration of climate change. Current climate change management centers on collecting data, managing drought conditions and areas where conversion of natural vegetation communities to cheatgrass or pinyon-juniper is occurring. Climate change impacts would continue, based on implementation of limited management responses which could decrease contiguity of habitat and change conditions, making habitat more suitable for some species, but less suitable for others.

Effects under Alternative B

Alternative B would prioritize treatments to remove threats that may exacerbate the negative effects of climate change on BLM special status species and ecosystem functions. Under Alternative B, climate change impacts would be prioritized, considered in project approval and funding, and specialists would use adaptive management in to address existing threats resulting from climate change. Climate change would be considered in project design and operation. Rapid Ecological Assessment would be employed to assess impacts of climate

change and maintain connectivity. These approaches would increase the ability of BLM management to respond to climate change.

Effects under Alternative C

Effects under Alternative C would be the same as under Alternative B.

Effects under Alternative D

Effects under Alternative D would be the same as under Alternative B.

Effects under Alternative E

Effects under Alternative E would be similar to under Alternative B, however proactive steps would be implemented to mitigate effects of climate change on BLM special status species. More timely mitigation efforts would occur to reduce impacts.

Special Status Species: Effects from Soil Resources

Effects Common to All Alternatives

Conservation measures to prevent erosion and other soil degradations are included under all alternatives. Protection of soil indirectly conserves plant and wildlife habitat, and preventing sedimentation in watercourses can improve the health of aquatic and semi-aquatic populations. Soil litter, appropriate vegetation, and good infiltration are important to land health and habitat quality. Implementation of BMPs and RAC Standards and Guidelines for soil-disturbing activities and application of reclamation measures will mitigate for soil disturbance, encourage healthy vegetation communities and wildlife habitats. Implementing BMPs and other mitigation measures for proposed activities located on sensitive soil types would minimize soil erosion and maintain soil stability and would indirectly help maintain and benefit sensitive plants.

Effects under Alternative A

Alternative A limits OHV use to designated roads and trails in highly erosive soil areas. This approach provides protection for soils in these areas from OHVs, but does not pro-actively prevent erosion in other locations.

Effects under Alternative B

Alternative B would apply an erosion control plan to projects on slopes, would apply soil amendments to minimize soil disturbance, and apply a CSU stipulation on highly erosive soils. These management approaches would diminish erosion and soil damage relative to current management, and better protect sensitive species habitat.

Effects under Alternative C

Alternative C should result in increased vegetation cover, more intact biotic soil crust, and increased litter compared to the other alternatives. As a result, the management approaches under Alternative C would diminish erosion and soil damage relative to current management and Alternative B and would protect

sensitive species habitat by reducing soil crust breakage through application of applying mulch.

Effects under Alternative D

Alternative D mandates that deep-rooted stabilizing vegetation, including native and nonnative plants, will be utilized to improve the soil surface. It also includes the approaches under Alternatives B and C to protect sensitive species habitat. Along with Alternative E, Alternative D includes the most specific actions to reduce soil damage and protect habitat.

Effects under Alternative E

Effects under Alternative E would be similar to those described for Alternative D.

Special Status Species: Effects from Water Resources

Effects Common to All Alternatives

Effective watershed management results in the minimization of erosion, the maintenance of hydrologic flow, healthy vegetative communities, and high quality habitat for special status species.

Developing water sources may result in more available water for special status wildlife species, as long as these species have access to the developments. Furthermore, developing water sources may lead to an increase in insect populations. If insect populations were to increase, special status birds, and small mammals (e.g. bats) could benefit as a result of more available forage; however, increases in insects could also result in more incidences of diseases such as West Nile virus. Development of water sources would require construction, during which short-term disturbance to special status species and their habitat would occur. All alternatives have the goals of improving water supply and maintaining water quality and floodplains in accordance with federal, state, and local laws.

Water resources sustain life, maintain vegetative community health, deliver hydrologic flow to channels and provide habitat to special status species, Effective watershed management minimizes erosion, maintains hydrologic flow, saturates soils and replenishes nutrients to maintain vegetative community health and special status species habitat. Developing water sources for human uses may lead to an increase in insect populations the increase is beneficial in providing food for special status birds and bats but may also increase the incidence of diseases such as West Nile virus.

Effects under Alternative A

Alternative A limits BLM-authorized activities in degrading watersheds and specific portions of urban watersheds at the most immediate risk of degradation, and limits OHV use in riparian areas. These approaches protect

water supply for special status species in these local areas, but provide limited oversight of watershed health and water quality on a regional scale.

Effects under Alternative B

In addition to the efforts under current management, Alternative B and the other action alternatives would establish a listing of priority watersheds and priority water supply areas based on presence of threatened and endangered species habitat (occupied and recovery areas), among other factors. These policies may improve management of water supply for special status species.

Effects under Alternative C

In addition to the approach under Alternative B, Alternative C would also use permitting, land acquisitions, and other realty actions to acquire minimum pool and in-stream flows or to gain access to water sources or developments. Alternative C would also establish priority watersheds and would apply management constraints for protection within these priority watersheds. Water sources would be developed with an emphasis on wildlife needs, increasing the quality of special status species habitat on BLM-administered land.

Effects under Alternative D

Effects under Alternative D would be similar to those described for Alternative C.

Effects under Alternative E

Effects under Alternative E would be similar to those described for Alternative C.

Special Status Species: Effects from Vegetation Resources

Effects Common to All Alternatives

Vegetation includes upland vegetation, noxious and invasive weeds, and riparian and wetland systems.

Range management actions to promote land health, such as seedings and land treatments, would occur under all alternatives. Land treatments would facilitate the maintenance of habitats in various stages of shrub or understory condition. Special status species would benefit as a result of actions that promote rangeland health. Rangeland health is discussed in more detail in the Livestock Grazing section.

Actions that would improve riparian and wetland PFC would occur under all alternatives. These actions are designed to increase the quantity and quality of riparian vegetation, thereby improving habitats for riparian- and wetland-dependent special status species.

Spread of noxious and invasive weeds decreases vegetative diversity and native vegetative production, thus diminishing habitat for special status species. Weeds

out-compete native species in disturbed areas and can create mono-cultures that are more prone to wildfire. Weed treatments using integrated pest management would be applied under all alternatives. These treatments may use chemical, mechanical, or biological means to reduce competition and improve native species diversity. Although weed treatments generally improve habitat in the long-term, short-term disturbances would occur, including disturbance and loss of cover, causing some species to temporarily avoid treated areas.

Effects under Alternative A

Under Alternative A, integrated pest management would continue to be used for weed control. Land health assessments would monitor the health of rangeland systems. Riparian management actions would continue to reduce the potential for degradation of riparian special status species habitat. The implementation of BMPs that address non-grazing impacts, such as water diversions, roads, and recreation, would avoid and mitigate many surface disturbances and erosion. No pinyon-juniper removal would occur.

Effects under Alternative B

Under Alternative B, a pinyon-juniper removal and thinning program would be initiated to aid in sagebrush restoration. As many as 20,000 acres would be restored annually, and an additional 6,500 acres thinned. Following the removal program, additional thinning of woodlands will occur annually. Removing pinyon-juniper woodlands would benefit sagebrush-dependent special status species, while reducing habitat for special status species found in pinyon-juniper woodlands. Thinning of pinyon-juniper woodlands, however, may benefit species that utilize open stands of pinyon-juniper by increasing vegetative and structural diversity.

Alternative B would manage for healthy and diverse forestlands to maximize sustained yield of forest products and economic development, and would also allow for salvage logging of burned stands. It would also limit stream crossings to minimize sedimentation.

Alternative B would allow sagebrush removal when needed for mineral extraction or other higher priority uses, which is less protective than approaches under the other action alternatives. It lacks provisions to promote native plant use in rehabilitation and stabilization projects and to restrict grazing in riparian areas. Alternative B and the other action alternatives would use appropriate control methods, including mechanical, biological and chemical to eradicate or control invasive, nonnative species and noxious weeds, and implement other policies to reduce the spread of noxious weeds.

Alternative B includes vegetation treatments for rangeland restoration, and aim to maximize ecological site potential to establish desired future condition, to benefit land health. Revegetation efforts would use the most effective plant species, not necessarily native species; would promote maintenance of ecological integrity; and would aim to restore depleted understory vegetation.

All these approaches would benefit special status species by maintaining and restoring habitat, more than current management.

Effects under Alternative C

Under Alternative C, a limited pinyon-juniper removal (as many as 3,500 acres) and thinning project would be initiated, to restore sagebrush ecosystems (**Table 2-1**). These actions would benefit sagebrush-dependent special status species, while reducing habitat for species found in pinyon-juniper woodlands, compared to Alternative A. However, these impacts would benefit species found in pinyon-juniper woodlands more, and benefit sagebrush-obligate species less, than Alternative B,

Alternative C would manage for healthy and diverse forestlands with a focus on wildlife habitat, forest health and fuels reduction, would allow salvage logging only to protect public safety, and includes mitigation measures for conducting forest/woodland treatments. For rehabilitation projects, Alternative C promotes use of native plant material and restoration techniques to establish desired plant communities. Alternative C would limit woodcutting or vegetative removal in riparian areas. Wildlife, livestock, or recreation implementation plans would consider impacts on riparian areas and meadows, and consider limits to livestock grazing in sensitive riparian areas (also D and E). In attaining PFC, the interim goal would be 85 percent (functioning at risk with an upward trend), progressing towards or attaining PFC, compared to 75 percent under Alternative B.

Rangeland treatments are similar to Alternative B, but Alternative C does the most to promote revegetation with native species and to limit sagebrush removal. Because special status wildlife species are more likely to use native plant assemblages as habitat, these policies would benefit special status species more than other alternatives (as long as the revegetation with native species was successful).

Effects under Alternative D

Alternative D would study pinyon-juniper removal but does not include a removal or thinning program. However, pinyon-juniper obligate special status species would be protected. Under this alternative, the BLM would engage interested parties to develop a restoration strategy that may include removal or thinning of pinyon-juniper in the future. Alternative D would also manage for healthy and diverse forestlands, and consider impacts on riparian areas, as under Alternative C. PFC goals would be the same as Alternative C. It protects against sagebrush removal in urban interface areas only.

Alternative D would allow salvage logging for public safety and to meet demand for wood. It includes mitigation measures, as under Alternative C. Alternative D would promote habitat for special status species more than current management, but less than Alternatives C or E.

Effects under Alternative E

Alternative E has a robust pinyon-juniper removal and thinning program to aid in sagebrush restoration. As many as 8,500 acres would be restored and an additional 6,500 acres thinned, less than anticipated under Alternative B, but more than the other alternatives. These actions would benefit sagebrush-dependent species, such as Greater Sage-Grouse, while reducing habitat for species found in pinyon-juniper woodlands.

Implementing Alternative E could result in the conversion of fewer low density pinyon-juniper areas to sagebrush than Alternative B, but more than Alternative C (on an annual basis). In regards to thinning dense pinyon-juniper woodlands, Alternative E is the same as Alternative B, but Alternative E could result in thinning more acres of dense pinyon-juniper per year than Alternative C.

Species that utilize pinyon-juniper woodlands, particularly open stands of pinyon-juniper, should benefit from the increased vegetative and structural diversity that would result from thinning dense pinyon-juniper stands, but overall the actions would provide most benefit to sagebrush-dependent species.

Alternative E would also manage for healthy and diverse forestlands, consider impacts on riparian areas, and protect sagebrush from removal, as under Alternative C. PFC goals would be the same as Alternative C. Alternative E would allow salvage logging for public safety, forest health, and to meet demand for wood. It includes mitigation measures as described under Alternative C. Alternative E has the highest potential to protect and promote habitat for special status species compared to other alternatives

Special Status Species: Effects from Fish and Wildlife Management*Effects Common to All Alternatives*

Special status species would benefit from the development of specific objectives and actions to protect and enhance habitat conditions for fish and wildlife. Restrictions on development within sensitive or priority habitats would lessen disturbance to special status terrestrial, aquatic, and semi-aquatic species, damage to plants, and degradation of habitat.

Actions common to all alternatives include modification of fences to facilitate wildlife passage, and marking the structures to reduce wildlife collision risk. Water troughs for livestock will be modified to allow wildlife access and prevent trapping, and BLM will coordinate with other agencies on mitigation measures for wildlife and wildlife habitat protection. All alternatives would also implement timing restrictions and distance buffers, as appropriate, to minimize impacts on wildlife from activities during important life cycle periods (e.g., breeding or major migrations). Implementing management actions to restore or improve wildlife habitat would benefit special status species.

Management to protect raptors, bats, migratory birds, and big game would also protect special status species in these groups or special status species that utilize similar habitats.

Effects under Alternative A

Current management is designed to manage wildlife habitat for a long-term goal of providing forage for reasonable numbers of big game. This approach could provide benefits to most special status species; however, managing solely for forage for big game may not provide some special status species with the most ideal habitat.

Effects under Alternative B

Alternative B would also manage for key habitat integrity to support fish and wildlife populations, with an emphasis on priority species and habitats. It would implement additional habitat improvement projects, and remove undesirable nonnative aquatic species (such as bullfrogs) from sensitive breeding grounds.

The BLM would apply CSU stipulations to areas surrounding important aquatic habitat, and manage priority wildlife habitat as ROW avoidance areas. Management would mitigate disturbance from land use authorization activities on big game species including pronghorn, bighorn sheep, and mule deer, and avoid disturbance to nesting migratory birds and important migratory pathways. It would inventory for bats before development near caves and restrict development within 1/4-mile of raptor nests. All these programs would benefit special status species.

Effects under Alternative C

Programs under Alternative C would be similar to Alternative B, with stronger protections for raptor nests, NSO instead of CSU stipulations for aquatic habitat areas, and ROW exclusion rather than avoidance areas. These programs would benefit special status species more than the other alternatives.

Effects under Alternative D

Programs under Alternative D would be similar to Alternative B, but some policies would only apply within the urban interface zone. Benefits to special status species would be greater than current management but less than the other action alternatives.

Effects under Alternative E

Programs under Alternative E would be similar to Alternative B, but would apply NSO stipulations as under Alternative C. These programs would enhance benefits to special status species compared to current management.

Special Status Species: Effects from Special Status Species Management*Effects Common to All Alternatives*

Special status fish, wildlife, and plant management actions would protect and work toward recovery of listed species and to prevent the federal listing of sensitive species. Actions common to all alternatives that would protect special status species include management of ACECs that protect special status species, special status species inventories of project areas prior to authorization of surface disturbance, mitigation and monitoring for special status plants and suitable nearby habitat. Under all alternatives, recovery and management plans would be implemented, recovery and conservation teams would be formed, and USFWS conservation recommendations would be implemented.

All the action alternatives provide management actions and development restrictions to protect Greater Sage-Grouse habitat.

Effects under Alternative A

Alternative A would work toward the reintroduction of Lahontan cutthroat trout, bighorn sheep and other endemics into suitable habitat. This approach benefits these species but does not adequately address concerns for all the special status species in the planning area.

Effects under Alternative B

Alternative B and the other action alternatives would promote maintenance and recovery of federally listed and proposed species by conserving and protecting their habitats. One new ACEC would be established for special status species under this alternative. Extensive management actions would be put in place to protect Greater Sage-Grouse habitat under this alternative, including soil treatments, limits on prescribed fire, pinyon-juniper treatments, limitations on mineral leasing, buffers around leks to protect from disturbance, restrictions on fence construction and ROW avoidance areas. This alternative would do more to benefit special status species than current management, but does not include reintroduction.

Effects under Alternative C

Under Alternative C, seven new ACECs would be established for management and protection of special status species. Alternative C would implement similar protections for Greater Sage-Grouse to Alternative B, but with stronger provisions, such as wider buffer zones around leks or other sensitive habitat areas, and ROW exclusion rather than avoidance areas. Protections to special status species would be greatest under Alternative C, as habitat- and species-disturbing activities would be the most restricted.

Effects under Alternative D

Actions under Alternative D would be similar to Alternative B; however two special status botanical species ACECs would be established under this alternative. Greater Sage-Grouse protections would be similar to Alternative B.

This alternative would protect special status species habitat more than current management, but less than the other action alternatives.

Effects under Alternative E

Alternative E would implement similar protections for Greater Sage-Grouse to Alternative B, with greater protections in some instances, such as wider fence restriction buffers. Reintroduction of special status endemic species is included, but only two ACECs (Churchill Narrows & Virginia Williams Pine Nut Mountains Williams Combleaf) would be established to protect special status plants. This alternative would benefit special status species and their habitat more than current management, Alternative B or Alternative D, but less than Alternative C.

Special Status Species: Effects from Wild Horse and Burro Management

Effects Common to All Alternatives

Wild horses and burros compete with some special status species for forage, water and cover. They consume relatively large amounts of vegetation (which can include special status plant species) and water, and can also cause substantial impacts on riparian areas. Wild horses and burros can also trample avian nests located in low vegetation or on the ground. All alternatives identify the need to maintain AMLs within HMAs and would use the gather process as a tool to meet that need. Gathering would help prevent excess impacts from overpopulation of herds and help ensure adequate forage, water and overall habitat condition for special status species. Gathers can cause short-term stress and displacement of special status species resulting in the disruption of life-cycle behaviors; however, the timing of gathers can reduce these impacts on most species.

Habitat monitoring, for sustainability would be undertaken under the action alternatives and may result in adjustment of AML. Fewer horses on the landscape would result in fewer impacts on wildlife habitat. This would also help in maintaining healthy habitat for special status species.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Special Status Species: Effects from Wildland Fire Ecology and Management*Effects Common to All Alternatives*

Wildland fire could be beneficial or detrimental to special status species and their habitats. Periodic fires may reduce dense understory and restore nutrients to soil. Fire may convert some late-successional vegetation to an earlier seral stage, increasing habitat and species diversity. However, fire can also result in the loss of habitat for species that prefer late seral communities, increased potential for erosion, and increased sedimentation and water temperatures in aquatic habitats from removal of upland vegetation. Fire can also cause long-term alternations of habitat, particularly for sagebrush habitats (or other shrub habitats that experience less than 12 inches of precipitation per year), which are slow to recover from fire, and vulnerable to competition from invasive weeds, which results in a loss of forage and cover for sagebrush-dependent species. Mortality of special status plants and wildlife can also occur from fires.

Under all alternatives, fuel treatments can aid in limiting the size of wildfires, thereby reducing the extent of impacts. ESR activities, such as erosion control measures and reseeding, performed following fires facilitate restoration of burned areas.

Fire suppression also has short-term, localized impacts on habitats for special status species. The use of heavy equipment or hand tools for fire breaks removes or crushes vegetation and disturbs soil, increasing erosion and the risk of invasive species spread. Furthermore, fire suppression actions can disturb special status species and cause them to avoid treatment areas.

Effects under Alternative A

Alternative A manages wildfires in Category A, B C, and D, each with target fire suppression goals to protect property and resources. Fire suppression could protect some special status species habitat, but can contribute to more damaging fires if dense understory vegetation builds up.

Effects under Alternative B

Alternative B would develop fire management plans to guide response to wildfire and prioritize suppression activities, and improve ESR. It includes provisions to prevent cheatgrass and other invasive species from dominating burned areas and altering the natural fire regime by re-establishing appropriate species based on the site potential and the probability of success. This approach would benefit special status species habitat more than current management.

Effects under Alternative C

Management under Alternative C would be similar to Alternative B, with more focus on protecting sensitive biological, cultural, and other natural resources, and use of native species in revegetation. This alternative would do the most to protect special status species habitat from fire damage.

Effects under Alternative D

Effects under Alternative D would be similar to those described for Alternative B, but would focus on the urban interface zone.

Effects under Alternative E

Effects under Alternative E would be similar to those described for Alternative B.

Special Status Species: Effects from Cultural Resources Management

Effects Common to All Alternatives

Management for cultural resources and protection of cultural ACECs would provide incidental protection of special status species habitat in areas that contain identified cultural resources through restriction of disturbance to cultural resource areas in order to minimize damage to artifacts, erosion, and vegetation loss.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Special Status Species: Effects from Paleontological Resources Management

Effects Common to All Alternatives

Management for paleontological resources and protection of paleontological ACECs would provide incidental protection of special status plant, wildlife, and fish habitat, through restriction of disturbance to paleontological resource areas in order to minimize vegetation loss and erosion. Promoting public visitation to areas of paleontological interest or importance could impact special status

species habitat, depending on the numbers of visitors to areas. Wildlife could be disturbed, plants may be trampled, invasive species introduced and spread, and wildlife may avoid habitat in areas of high visitation, but these impacts would be minor and localized.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Special Status Species: Effects from Visual Resources Management

Effects Common to All Alternatives

Impacts on special status species would vary, depending on the number of acres identified by VRM class. In general, management of Class I or II VRM designated areas would allow fewer intrusions to the landscape resulting in fewer impacts on plant and wildlife habitat.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Special Status Species: Effects from Caves and Cave Resource Management

Effects Common to All Alternatives

Under all alternatives, caves would be evaluated for their potential value as bat habitat. Caves with identified bat resources would be assessed and prioritized for public closure to protect bat habitat, minimize potential impacts on roosting bats, and prevent the spread of disease (such as White-nose syndrome, a fast-spreading fungal disease). Implementation of other measures or use restrictions to protect caves and cave resources would also serve to protect habitat and limit disturbance to special status bats. However, installation of bat gates could prevent other wildlife, including bighorn sheep, from using caves for refuges or for water sources. If a cave may provide an important water source for wildlife, a cave inventory should be conducted before installing bat gates.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Special Status Species: Effects from Forestry and Woodland Product Management

Effects Common to All Alternatives

Noise, surface disturbance and loss or fragmentation of habitat resulting from the harvest of forest products could impact special status species. Additionally, harvesting forest products could result in the mortality of some species. These activities are relatively limited in the planning area, and impacts on special status species should be localized, minor, or not likely to occur within critical special status plant species habitat

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Special Status Species: Effects from Livestock Grazing Management

Effects Common to All Alternatives

Appropriately managed livestock grazing may benefit special status species habitat by maintaining grass and forb diversity and removing fire-prone understory vegetation, but may also be detrimental if excessive levels result in loss of cover and forage for special status species, or trampling of sensitive riparian habitat.

Overgrazing by livestock can also result in the elimination of bunchgrasses, which results in an increase in bare ground that favors the invasion of cheatgrass (Reisner et al. 2013). Overgrazing by livestock along riparian areas can result in the loss of streamside vegetation, increased sedimentation in the water, and increases in water temperature, which can have negative impacts on fish populations (Kauffman and Krueger 1984). Waste from cattle in waterbodies can result in a decrease in oxygen for fish. Furthermore, nitrites and ammonia from cattle urine and feces are chronically toxic to fish (Taylor et al. 1989).

All alternatives would comply with standards and guidelines for livestock grazing, and manage allotments toward meeting Rangeland Health Standards. Allotments meeting standards provide superior habitat, because they have healthier vegetation, more native species, and less soil damage. All alternatives would rest burned areas from livestock grazing for a minimum of two growing seasons. New grazing fences would be built to comply with wildlife standards.

These actions would promote habitat conditions for healthy special status plant, fish and wildlife populations, which is especially important during times when additional stressors (such as drought or fire) impact habitat.

Effects under Alternative A

Under current management, existing range management programs and closures would continue (see **Table 2-1**). These programs promote rangeland health and make provisions to improve habitat for wildlife, including special status species, but some lands do not meet rangeland health standards and also likely provide poor habitat due to loss of species diversity, understory cover, and forage and riparian degradation.

Effects under Alternative B

Under Alternative B, there would be a modest increase in acreage unavailable for livestock grazing, and increased focus on restoration. Alternative B allows prescriptive grazing for vegetative management purposes as necessary. Acres available and unavailable for grazing would be similar to Alternative A.

Effects under Alternative C

Under Alternative C, land open to grazing would be reduced by 2.6 million acres and grazing utilization levels would be reduced to 73 percent of current AUM levels (**Table 2-1**). Areas containing Greater Sage-Grouse priority habitat would not be available for grazing, resulting in more available forage for special status species. If the reduced utilization level did not improve the ecological condition of allotments prior to the next periodic review, further reductions could be made based on monitoring. These provisions would improve the health of allotments that were not meeting Rangeland Health Standards due to overgrazing, and could provide more cover for special status species. Compared to Alternatives A and B, Alternative C would result in more available forage and cover for special status species.

Effects under Alternative D

Alternative D allows for prescriptive grazing only within the urban interface area. Under Alternative D, grazing would continue to be managed at existing levels, with re-examination based on monitoring and land health assessments during periodic review process every 10 years or on a case-by-case basis. Effects would be similar to those described for Alternative A.

Effects under Alternative E

Under Alternative E, grazing would continue to be managed at existing levels, with re-examination based on monitoring and land health assessments conducted during a periodic review process. Effects would be similar to those described for Alternative A.

Special Status Species: Effects from Geology and Mineral Management*Effects Common to All Alternatives*

Impacts on special status species and habitat from mineral exploration and development generally occur from surface disturbance causing loss and fragmentation of habitat, as well as disturbances from noise and activity associated with construction, and operation of facilities and roads. For special status plants growing within materials of commercial value, removal of the material would result in a loss of habitat nutrients and a disruption in natural processes and habitat structure. Occasionally, there is direct mortality to special status species animals or plants, though mitigation measures are adopted to significantly reduce this potential.

Impacts on special status plants include disturbance to soil horizons, loss of habitat nutrients, and disruptions in natural processes that are conducive to sensitive species plant survival and re-establishment.

In some situations, surface water may also be affected. Identifying lands open or closed to mineral development, open with standard stipulations or open with special stipulations would protect special status species by either restricting mineral uses in areas or providing mitigation for adverse impacts. Generally, greater restriction on disturbance leads to less impact on special status species and habitat.

All alternatives would make mineral resources (leasable, locatable, salable) available for extraction or development but with differing open acres, stipulations and conditions of approval to protect other resources. Development of new sites and associated impacts on special status species would be analyzed under the NEPA, with mitigation and stipulations applied to reasonably protect affected resources. Reclamation or rehabilitation of mineral operations before closure includes recontouring, stabilization, revegetation, and removal of facilities. Under all alternatives, 194,900 acres are withdrawn from locatable mineral entry.

Special Status Species: Effects from Mineral Materials Management

Effects under Alternative A

Under this alternative, 4,239,100 acres would remain open to mineral material disposal (**Table 2-1**). New proposed sites would be analyzed under NEPA requirements. Impacts on wildlife and habitat would be avoided or mitigated with applied terms or stipulations.

Mineral material sites would result in loss of habitat for special status species and long-term disturbance (e.g., surface, noise, and activity) in the vicinity of the sites as long as they remain open and active. These disturbed areas can increase the risk of invasive weed introduction and spread, while decreasing habitat quality. Sites that require new access roads would also result in loss and fragmentation of habitat and an increase in dust impacts depending on frequency of use and proximity. There is also the potential of direct mortality to special status wildlife species as a result of activities associated with mineral material sites.

Effects under Alternative B

The BLM would manage 3,996,100 acres as open to mineral material disposal, almost the same number of acres as under Alternative A with standard authorization terms and stipulations. This alternative would seek to maximize and promote the supply of mineral materials. Special status species and habitat would continue to be impacted (as described under Alternative A) due to the maximization of material sites.

Effects under Alternative C

Under this alternative, the BLM would manage 1,798,400 acres as open to mineral material disposal, a 58 percent decrease compared to current management (**Table 2-1**). The focus would be on developing the fewest number of material sites necessary while meeting demands. Special status species and habitat would receive fewer impacts due to fewer acres open to mineral material disposal, and fewer acres open with standard authorization terms and stipulations. The minimization of new material sites would also result in fewer impacts.

Effects under Alternative D

Management under this alternative would be the same as Alternative B, with the added provision to close facilities if they are incompatible with adjacent land uses within the urban interface. This management would reduce impacts in localized areas only.

Effects under Alternative E

Management under Alternative E would manage 3,024,600 acres as open to mineral material exploration and development, a 29 percent reduction from current management. Therefore, this alternative would result in fewer impacts on special status species than current management.

Special Status Species: Effects from Fluid Minerals Management*Effects under Alternative A*

Under this alternative, the BLM would manage 3,964,200 acres as open to leasing with 700 acres open to leasing but with NSO stipulations. Stipulations and conditions of approval would be applied to protect other resources, including special status species habitat. Fluid mineral exploration and development would result in impacts on wildlife and habitat similar to those for management of mineral materials. In addition to those impacts, the presence of structures such as buildings or transmission lines can cause injury or death to avian species as well as providing artificial perching/hunting and nesting opportunity for raptors and ravens. Therefore, predation is unnaturally increased along these lines. Construction of geothermal wells would affect groundwater levels in aquifers and affect surface water flows, which would impact special status species habitat. The degree to which habitat would be impacted is dependent on water demand or usage that would affect surface water quantity. Developments can cause disruptions to aquifers and resultant dewatering of springs, damaging the habitat for special status plants. These impacts would be reduced based on implementation of BMPs, permit stipulations, and mitigation measures.

Effects under Alternative B

Under this alternative, the BLM would manage 4,034,700 acres as open to leasing, with 404,600 acres open to leasing with a NSO stipulation and 2,120,200

acres open with a CSU stipulation. This alternative would open more acres to fluid mineral leasing and extraction than current management but would apply restrictive stipulations to many acres. Impacts on special status species and habitat would be as discussed under Alternative A, but on fewer acres. NSO stipulations would protect special status species from all surface disturbance, though disturbance may still occur in the vicinity. CSU stipulations would provide protection from surface disturbance during season of use or sensitive periods. However, subsurface disturbance may still harm special status species habitat by interrupting aquifer flow or dewatering springs critical to habitat use. Overall, this alternative may reduce impacts on special status species compared to current management.

Effects under Alternative C

Under this alternative, the BLM would manage 2,721,500 acres open to leasing with standard lease terms and stipulations, 1,039,200 acres as open to leasing with a NSO stipulation, and 1,242,800 acres with a CSU stipulation. Impacts on special status species and habitat, as discussed under Alternative A, would be reduced under this alternative with greatly reduced acreage open to leasing. Alternative C would apply restrictive stipulations on more acres, and greater acreage would be managed as closed to leasing, which would protect special status species.

Effects under Alternative D

Under this alternative, the BLM would manage 4,066,200 acres as open to leasing with 864,800 acres open to leasing with a NSO stipulation and 2,071,400 under a CSU stipulation. Impacts on special status species and habitat would be similar to Alternative B, with reduced impacts on special status species on those acres with restrictive stipulation applied, which are greater than under current management.

Effects under Alternative E

Under this alternative, the BLM would manage 3,796,000 acres as open to leasing with 1,151,600 acres open to leasing with a NSO stipulation and 1,844,900 acres under a CSU stipulation. Impacts on special status species and habitat would be similar to Alternative B, with reduced impacts on special status species on those acres with restrictive stipulation applied, which are greater than under current management.

Special Status Species: Effects from Nonenergy Leasable and Locatable Minerals Management

Effects under Alternative A

Under this alternative, the BLM would manage 4,064,400 acres as open to leasing. Nonenergy leasable mineral exploration and development would result in impacts on wildlife and habitat similar to those from salable minerals exploration and development.

Under this alternative, 3,700 acres are petitioned for withdrawal. Locatable mineral and solid mineral exploration and development would include the potential to remove special status species habitat through surface disturbances associated with exploration road construction and drilling, mine development including; mine pits, haul roads, processing, waste dumps, substations, power lines and other infrastructure. The degree of impacts on special status species is dependent on the proximity of facilities to special status species habitat and the size of the disturbance footprint.

Effects under Alternative B

Under this alternative, the BLM would manage 3,821,300 acres as open to leasing, and 439,600 acres petitioned for withdrawal. However, there would be more acres petitioned for withdrawal. Impacts on special status species would be reduced as a result of the reduction in open acreage to mining. Alternative B would also restrict nonenergy mineral leasing and mineral material disposal within Greater Sage-Grouse habitat, but only if it was determined that there would be adverse impacts on Greater Sage-Grouse or their habitat. In other areas, impacts would remain the same as under Alternative A.

Effects under Alternative C

Under this alternative, the BLM would manage 1,842,400 acres as open to leasing, and 117,500 acres petitioned for withdrawal. With reduced acreage open to mining compared to Alternative A impacts on special status species would be reduced as a result of the closed areas, compared to current management. Alternative C would also restrict nonenergy mineral leasing and mineral material disposal within Greater Sage-Grouse habitat, without the requirement to determine adverse impacts first. Thus, this alternative would protect more special status species habitat from mining impacts than Alternative A and would allow impacts on fewer acres.

Effects under Alternative D

Under this alternative, impacts on special status species and habitat from nonenergy leasable minerals would be similar to Alternative C. For locatable minerals, 440,800 acres would be petitioned for withdrawal, Impacts would nearly be the same as Alternative C.

Effects under Alternative E

Under this alternative, the BLM would manage 3,017,400 acres as open to nonenergy leasable mineral leasing, and 727,100 acres petitioned for withdrawal from locatable mineral entry. With fewer acres open to mining compared to Alternative A and impacts on special status species would be reduced under this alternative. Leasing and disposal would also be restricted within Greater Sage-Grouse habitat. Thus, this alternative would protect more habitat from locatable mining impacts than Alternative A, and would allow impacts from nonenergy leasable minerals on fewer acres than Alternative.

Special Status Species: Effects from Recreation and Visitor Services*Effects Common to All Alternatives*

Direct impacts from recreation management actions include loss or modification of habitat from constructing recreational facilities, including roads. Recreation management actions that result in increased human presence could have localized disturbance impacts on special status species from dispersed activities such as hiking, biking, camping, fishing, hunting, and sightseeing. Commercial, competitive, and group recreational activities could have greater impacts, but effects would be minimized through use restrictions and mitigation measures. Increased human-wildlife interaction could cause physiological stress, net or habitat abandonment by sensitive animals.

OHV use is the most damaging form of recreation to special status species, as a result of habitat trampling and disturbance. OHV management actions that result in increased OHV use would result in localized impacts on special status species. Impacts could include stress and displacement of wildlife, destruction of plants, and degradation of habitat or sedimentation of waterways. OHV use can also alter the seasonal use patterns of wildlife species.

All alternatives would provide a wide range of developed and dispersed recreation opportunities to meet projected recreation demand in the planning area. All alternatives would also manage recreation use on BLM-administered land to protect natural resources, provide for health and safety, and minimize conflicts among land uses. The BLM strives to increase public awareness of land stewardship through interpretation and education.

Effects under Alternative A

Under this alternative the BLM would continue to manage 67,700 acres in the Walker Lake and Alpine SRMAs. Managing lands as SRMAs could encourage additional use of these lands and thus increase disturbances to special status species; however, by designating SRMAs, disruption of other special status species areas may be reduced by focusing recreationalists in specific areas. Management within SRMAs can reduce the impacts of recreational activities, and adverse impacts can be monitored and addressed.

OHV use would be the most detrimental to special status species under Alternative A. Most of the planning area (3,840,300 acres) would be open to OHV use with minimal limited (924,300 acres) and closed (31,800 acres) designated areas.

Effects under Alternative B

Under Alternative B, the BLM would manage 76,100 acres as SRMAs, 12 percent more than Alternative A. The Alpine and Walker Lake SRMAs would be maintained but reduced in size, and four additional SRMAs designated, identifying recreation as the principal use of these lands. Managing lands as SRMAs could encourage additional use of these lands and thus increase the level

of disturbances to special status species in these areas. Alternative B would also establish 7 ERMA, which provide less funding for public access and improvements than SRMA, and thus may have less visitation and fewer impacts on special status species populations.

Under Alternative B, the BLM would manage 95,300 acres as open to OHV use, with 4,677,000 acres limited and 26,700 acres closed. Areas that would be managed as closed to OHV use include priority habitat areas. This alternative would reduce impacts from OHV use compared to current management, but less than the other action alternatives.

Effects under Alternative C

Under Alternative C, 74,700 acres would be designated as SRMA, 10 percent more than Alternative A. The Walker Lake SRMA would be maintained and the Alpine SRMA expanded, and one new SRMA, Sand Mountain, would be established. Fourteen ERMA would also be established. OHV use would be the most restricted under this alternative, with 1,190,500 acres closed, 3,013,500 acres limited, and 1,300 acres open to OHV use. Alternative C would minimize development of recreational facilities that attract visitors and would place the most limitations on OHV use, resulting in the fewest impacts on special status species.

Effects under Alternative D

Effects would be similar to those described under Alternative B, but Alternative D would be more effective at reducing impacts from OHV use by further restricting OHV permitted use areas, including use in important habitat areas. Under this alternative, the BLM would manage 30,600 acres as closed, 4,748,400 acres as limited (including priority habitat areas), and 22,700 acres as open. Three new SRMA would be designated, and one (Walker Lake) closed, for a total of 67,100 acres in SRMA, approximately the same as Alternative A. Four ERMA would also be established, including one in the urban interface zone.

Effects under Alternative E

This alternative would designate four new SRMA while reducing the size of the Walker Creek SRMA, for a total of 106,100 acres, 57 percent more than Alternative A. Impacts on special status species in SRMA may be increased by human visitation; however, SRMA may serve to concentrate recreation away from other areas. Fourteen ERMA would also be established. Under this alternative, the BLM would manage 24,100 acres as closed, 4,717,300 acres as limited (including priority habitat areas), and 55,700 acres as open to OHV use. These closure levels and limitations are more protective of special status species than Alternative B, but less protective than Alternatives C or D. All the action alternatives are far more protective of wildlife from OHV impacts than current management.

Special Status Species: Effects from Comprehensive Travel and Transportation Management

Effects Common to All Alternatives

Under all alternatives, roads can decrease the quantity and quality of habitat for special status species. Roads and trails can result in an increase in invasive plant species, can increase human-wildlife interactions, and can fragment habitats, reduce wildlife refugia, cause mortality to special status species, and alter home range and migration corridors. Motorized vehicle use and associated human uses can degrade habitats from surface disturbance, including critical habitat niches, such as den sites, nest sites, important foraging areas, travel corridors, and refugia, and can displace and stress animals. Flooding and erosion from poorly maintained roads and trails can degrade surrounding aquatic habitats.

All alternatives would develop, implement, and monitor travel and transportation implementation plans for all identified travel management areas, and manage uses on BLM-administered lands to meet the travel and transportation needs of all types of land users.

Effects under Alternative A

Under Alternative A, there would be no change to the current acreage open to motorized and mechanized travel (see **Table 2-1**) or limited to existing routes. The impacts described above would continue.

Effects under Alternative B

Under Alternative B, over 3,750,000 additional acres (**Table 2-1**) would be limited to existing routes. Alternative B would manage 4,300 acres as closed to motorized and mechanized travel and an additional 26,700 acres as closed to motorized travel but limited to mechanized travel. The increase in acres restricted to existing routes and closed areas would provide more protection for special status species and their habitat from road impacts than under current management.

Effects under Alternative C

Under Alternative C, approximately an additional 1.7 million acres (**Table 2-1**) would be managed as closed to motorized travel and an additional 2 million acres limited to existing routes. The smallest amount of acreage would remain open to motorized travel, resulting in the highest level of protection to special status species and their habitat from motorized travel impacts.

Effects under Alternative D

Alternative D effects would be similar to those described for Alternative B, though with fewer impacts because fewer acres would be managed as open to motorized and mechanized travel and more would be limited to existing routes.

Effects under Alternative E

Under Alternative E, effects would be similar to those described for Alternatives B and D.

Special Status Species: Effects from Lands and Realty*Effects Common to All Alternatives*

Impacts on special status species from lands and realty management include habitat loss, fragmentation, and degradation, introduction and spread of invasive species; disturbance to species; direct mortality to species, and loss of species diversity from ROW development and other permitted facilities. Power lines, pipelines and road increase the density of human presence which would increase stress on special status wildlife during critical periods (e.g. breeding, migration, and wintering periods). Mitigation may limit the extent of these impacts. Lands and realty management may also benefit special status species by acquiring sensitive habitat and reducing the checkerboard pattern of BLM land administration and the size of BLM-administered blocks of land. Larger blocks of contiguous lands allow for consistent management and increase habitat quality and allow for restoration of degraded habitat on acquired lands.

Under all alternatives, BLM will continue to manage authorized ROWs, including 440,000 acres within utility corridors, will encourage new transmission corridors and facilities (60 kilovolts or larger) proposed on BLM-administered lands to utilize existing corridors and underground components in visually sensitive areas and will consider natural, visual, and cultural resources, and wildlife habitat in analyzing utility proposals.

Effects under Alternative A

Alternative A does not delineate additional ROW avoidance or exclusion areas. Existing ROW exclusion areas (**Table 2-1**) would continue under current management. Important wildlife habitat areas would not be protected from ROW development, increasing the likelihood of disturbance, habitat fragmentation, and other impacts on special status species. Under this alternative, 179,700 acres of BLM-administered land would be identified for disposal. Disposal lands may benefit special status species if BLM is able to acquire other land to form contiguous habitat parcels. The BLM would not identify any lands for disposal that were known to contain special status species.

Effects under Alternative B

Under Alternative B, over a million acres (**Table 2-1**) would be set aside as ROW avoidance areas, including implementation of mitigation measures to avoid or reduce impacts on special status species habitat. ROW exclusion areas and lands identified for disposal would remain at similar levels to Alternative A. Under this alternative, 273,500 acres of BLM-administered land would be identified for disposal. Overall, management under Alternative B would be more

protective of special status species than current management because of the establishment of avoidance areas.

Effects under Alternative C

Under Alternative C, 2,675,800 acres would be managed as ROW exclusion areas and over 369,000 acres (**Table 2-1**) as avoidance areas. In addition, no BLM-administered land would be identified for disposal under this alternative. This alternative would provide the most protection to special status species habitat from ROW development on BLM-administered land.

Effects under Alternative D

The impacts on special status species under Alternative D would be similar to Alternative B except fewer acres of avoidance area would be designated (1,226,100 acres). This alternative would protect special status species habitat from ROW development more than current management but less than the other action alternatives.

Effects under Alternative E

Under Alternative E, the acreage set aside as ROW exclusion areas would increase over 40,000 acres compared to current management. ROW avoidance areas would be established on 1,448,200 acres. Acres identified for disposal would also increase. Special status species would be protected from habitat degradation and other impacts more under this alternative than under current management.

Special Status Species: Effects from Renewable Energy

Effects Common to All Alternatives

Renewable energy development could impact special status species by removing vegetation for construction of power lines, roads, and communication sites and other facilities, which fragment habitat and remove vegetation comprising wildlife habitat. Human disturbances from construction and operation of facilities, including noise, movement, and vibrations, could cause short-term disruption of special status wildlife behavior. Wind turbines cause injury and mortality to raptors, such as Golden Eagle and other birds, and injury and barotrauma to special status bats in their vicinity. In summary, impacts on special status species from renewable energy projects include direct mortality, habitat fragmentation, habitat degradation, and the alteration of normal behavior. BMPs, stipulations, and mitigation measures applied as part of these projects would limit impacts to some degree.

Effects under Alternative A

Under current management, no avoidance areas for wind energy have been designated, and approximately 900,000 acres (**Table 2-1**) are variance areas for solar projects. Variance areas allow development but require provisions to protect resources in the area. Outside variance areas, utility-scale solar is not

permitted. Special status species in variance areas are at risk from the impacts described above.

Effects under Alternative B

Alternative B would designate approximately 775,000 acres as variance areas for solar energy development, and 1,220,200 acres as avoidance areas for wind energy turbines or transmission lines. These provisions would protect special status species in the designated areas more than current management.

Effects under Alternative C

Renewable energy impacts on special status species would be reduced most under Alternative C due to the designation of 2,073,200 acres as wind energy exclusion areas. Approximately 580,000 acres would be variance areas for utility-scale solar development, preserving more acreage from the impacts associated with large-scale solar projects.

Effects under Alternative D

Impacts under Alternative D would be similar to those described for Alternative B.

Effects under Alternative E

Impacts under Alternative E include 629,900 acres of variance areas designated for utility-scale solar, and 956,900 acres in wind energy avoidance areas. This alternative would protect special status species populations more than current management or Alternatives B or D, but less than Alternative C.

Special Status Species: Effects from Areas of Critical Environmental Concern

Effects Common to All Alternatives

Generally, special management areas such as ACECs result in increased protection of special status species, and long-term improvement or maintenance of habitat quality as a result of special management and use restrictions in these areas.

Effects under Alternative A

Under current management, the planning area includes six ACECs, the largest being the Stewart Valley Paleontological Area (**Table 2-1**), for a total of 21,800 acres. These areas restrict development to protect sensitive resources, and provide incidental protection to special status species habitat from loss or damage. Current ACECs designated specifically for special status species are the Carson Wandering Skipper ACEC and the Virginia Range Williams Combleaf Habitat Area ACEC.

Effects under Alternative B

Under Alternative B, an additional 9 ACECs would be established in the planning area, for a total of 371,170 acres. Management of ACECs would also

enhance protection for special status species from development in these areas as an incidental result of protection of other resources, primarily cultural resources. Churchill Narrows Buckwheat Botanical ACEC and the Virginia Range Williams Combleaf Habitat Area ACEC would be designated under this alternative specifically for special status species.

Effects under Alternative C

Under Alternative C, an additional 18 ACECs would be established in the planning area, for a total of 786,270 acres. This alternative would protect the largest amount of land in ACECs and includes ACECs for special status botanical species, the Carson Wandering Skipper, and Greater Sage-Grouse. Management of ACECs would also enhance protection for other special status species from development in these areas.

Effects under Alternative D

Under Alternative D, 180,000 acres would be protected in a total of ten ACECs. This alternative manages more acreage in ACECs than Alternative A, but less than Alternatives B or C. Management of ACECs would also enhance protection for special status species from development in these areas. ACECs designated specifically for special status species are the Pine Nut Mountains Williams Combleaf Botanical ACEC, Churchill Narrows Buckwheat Botanical ACEC, and Virginia Range Williams Combleaf Botanical ACEC.

Effects under Alternative E

Under Alternative E, 82,770 acres would be protected in eight ACECs. This alternative manages more acreage in ACECs than Alternative A, but less than the other action alternatives. It would provide additional protection in newly designated ACEC areas, compared to current management. ACECs designated specifically for special status species are the Churchill Narrows Buckwheat Botanical ACEC and Virginia Range Williams Combleaf Botanical ACEC.

Special Status Species: Effects from Back Country Byways

Effects Common to All Alternatives

Special status species may be displaced and habitat fragmented by development of Back Country Byways in their immediate environments. Plants could be trampled, invasive species introduced and wildlife could be disturbed by increased human presence during sensitive seasonal periods, such as breeding, nesting, and migration. These adverse impacts would be localized, with the exception of invasive species, and the public educational benefit of increased wildlife awareness might indirectly benefit special status species.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Special Status Species: Effects from National Trails

Effects Common to All Alternatives

Management actions for preserving national historic trails would provide special status species protection through habitat preservation by restricting surface-disturbing and other disruptive activities within the protected zone of the trail.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Special Status Species: Effects from Wild and Scenic Rivers

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under this alternative, eligible river corridors would be given protection either through continued interim protective management or the development of comprehensive river management plans. This would provide additional measures along the segments of the East Fork Carson River that would promote the health of habitat for special status species along with hydrologic function.

Effects under Alternative B

There would be no objective to protect eligible river segments under Alternative B, and therefore no additional special protection to special status species found in these segments.

Effects under Alternative C

Under Alternative C, the BLM would maintain the free-flowing character of eligible river segments, and allow no activities within the river corridor that would alter the tentative classification of those river segments. These management actions would protect special status species populations found in these river segments, more than Alternatives A or B.

Effects under Alternative D

Effects under Alternative D would be the same as under Alternative C.

Effects under Alternative E

Effects under Alternative E would be the same as under Alternative C.

Special Status Species: Effects from Wilderness Study Areas

Effects Common to All Alternatives

All alternatives would maintain the same acreage of WSAs (**Table 2-1**). Lands found to possess wilderness characteristics will be managed for wilderness values along with other uses, while applying management restrictions to reduce impacts on wilderness characteristics. No surface disturbance, permanent new development or ROWs would be allowed in these lands. These restrictions would benefit special status species populations found in the WSAs by limiting disturbance to animals and reducing habitat loss and fragmentation associated with development.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Special Status Species: Effects from Back Country Wildlife Conservation Areas

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

No BCWCAs would be designated under this alternative.

Effects under Alternative B

No BCWCAs would be designated under this alternative.

Effects under Alternative C

Under Alternative C, 817,800 acres would be preserved as BCWCAs, which would safeguard special status species habitat within these locations, allow only dispersed non-motorized recreation opportunities, and maintain the surface values of back country areas. This management program would benefit special status species found in these conservation areas by preserving habitat quality and limiting fragmentation and disturbance.

Effects under Alternative D

No BCWCAs would be designated under this alternative.

Effects under Alternative E

No BCWCAs would be designated under this alternative.

Special Status Species: Effects from Tribal Interests

Effects Common to All Alternatives

Implementing management actions that protect Native American traditional use areas would help to protect and sustain special status species habitat. Tribal consultation is not likely to adversely impact special status species.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Special Status Species: Effects from Public Health and Safety

Effects Common to All Alternatives

Management actions to provide for public safety could also benefit special status species. Closing abandoned mines could cause loss of bat habitat; however, if the mines are closed in a manner that allowed access to bats, these impacts

would be avoided. More specifically, installing fences around and bat gates within abandoned mines would prevent injury to the public as well as reduce disturbance to bats, especially during the critical hibernation or maternity periods. Furthermore, fencing may reduce the potential for special status species mortality by keeping these species away from dangerous shafts.

Actions to remediate contaminated sites would benefit wildlife habitats and populations, especially those that depend on riparian and wetland habitats. Reducing contaminants in the environment reduces the potential for ingestion by animals and bioconcentration via the food chain.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Special Status Species: Effects from Facilities and Transportation Maintenance

Effects Common to All Alternatives

Development of tracks and facilities would damage and fragment special status species habitat in localized areas. Restrictions on locations of these facilities would protect special status species habitat in these areas. Impacts would be minor and localized.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Impacts on Greater Sage-Grouse

The BLM, in conjunction with the Forest Service, is currently preparing the Greater Sage-Grouse Land Use Plan Amendment (LUPA) and EIS, for the Nevada-Northeastern California Sub-Region. The LUPA/EIS addresses a range of alternative conservation measures for Greater Sage-Grouse in the Great Basin population areas. A separate LRMP/EIS effort led by the Forest Service will address conservation needs for Greater Sage-Grouse in the Bi-State Distinct Population Segment, an isolated population located near Mono Lake and the White Mountains. Within CCD, Greater Sage-Grouse are found in both the Southern Great Basin population area as well as in the Bi-State Distinct Population Segment. CCD alternatives management actions for Greater Sage-Grouse apply to both range-wide (Great Basin) populations and the Bi-State Distinct Population Segment. All Greater Sage-Grouse habitat in the Bi-State Distinct Population Segment is considered PPMA; thus management actions for PGMA apply only to the range-wide population and not the Bi-State Distinct Population Segment.

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under Alternative A, management of threats to Greater Sage-Grouse populations and habitat from pinyon-juniper encroachment, invasive weeds, infrastructure, mineral development, fencing, and wildfire would continue in accordance with existing land use planning documents and current BLM policy and guidance. Grazing would continue at current levels in Greater Sage-Grouse habitat areas. Developments, infrastructure, and invasive weeds would continue to spread and fragment habitat. This alternative would be inadequate to address threats to Greater Sage-Grouse populations in the Great Basin and Bi-State Distinct Population Segment area.

Effects under Alternative B

Alternative B and the other action alternatives would remove pinyon and juniper in Greater Sage-Grouse habitat areas to limit encroachment into sagebrush. All the action alternatives would require mitigation for disturbance in Greater Sage-Grouse habitat that resulted in habitat loss, would avoid using pesticides during the nesting and early brood-rearing season, and would limit the construction of tall structures and fences in the vicinity of leks. Livestock grazing would not be limited in Greater Sage-Grouse habitat.

Alternative B would undertake habitat enhancement projects, such as weed removal, in PPMA, and would limit use of prescribed fire within PPMA. After soil disturbance or seeding, the land would be protected from further disturbance for two growing seasons or until desired habitat conditions have been met.

These management approaches should enhance the quality of Greater Sage-Grouse habitat in PPMA but would not benefit PGMA.

Alternative B would restrict activities within two miles of active leks during nesting season. For fluid minerals, Alternative B would apply CSU timing limitations for activity within PPMA and PGMA, from May 15 to August 15 for the Great Basin, and to September 15 for the Bi-State Distinct Population Segment. Locatable mineral projects would require off-site mitigation. Nonenergy mineral leasing and mineral material disposal would be permitted. The BLM would manage PPMA as ROW avoidance areas. These approaches would protect habitat in PPMA but would provide only limited protection to PGMA.

Effects under Alternative C

Alternative C has the most restrictions on development and disturbance in Greater Sage-Grouse habitat, both PPMA and PGMA. It would undertake habitat enhancement projects in both PPMA and PGMA and would restrict soil disturbances for two growing seasons following re-seeding. Prescribed fire would be prohibited within PPMA and PGMA.

Under Alternative C all allotments in PPMA and PGMA would not be available for livestock grazing (see **Table 2-1**). Water developments would be drained when possible to avoid spreading West Nile Virus.

Alternative C would restrict activities within 4 miles of active leks in PPMA and PGMA during the lekking season. Both PPMA and PGMA would be managed as closed to fluid mineral leasing under Alternative C. Off-site mitigation would be required for locatable mineral projects. PPMA and PGMA would be managed as closed to nonenergy mineral leasing and mineral material disposal. The BLM would manage both PPMA and PGMA as ROW exclusion areas, more restrictive than avoidance areas. Alternative C would be more protective of Greater Sage-Grouse and habitat areas than Alternatives A, B or D.

Effects under Alternative D

Alternative D would require re-seeding after soil disturbance, encourage habitat enhancement, and limit use of prescribed fire similar to Alternative B. Management for West Nile Virus under Alternative D would be similar to Alternative C. Alternative D would maintain livestock grazing in Greater Sage-Grouse habitat.

The BLM would manage PPMA and PGMA with NSO stipulations for fluid mineral leasing. Locatable mineral mitigation would be required, and nonenergy mineral leasing and mineral material disposal would be permitted. The BLM would manage both PPMA and PGMA as ROW avoidance areas. Activities would be restricted within 4 miles of leks during the lekking season. Overall, Alternative D would better protect Greater Sage-Grouse and their habitat than current management, and more protective than Alternative B because most

restrictions cover both PPMA and PGMA. However, it would place fewer restrictions on development than Alternatives C or E.

Effects under Alternative E

Alternative E would require re-seeding after soil disturbance. Alternative E would encourage habitat enhancement and West Nile Virus avoidance similar to Alternative C. Alternative E would limit use of prescribed fire would be limited in both PPMA and PGMA. Livestock grazing would continue in PPMA.

Alternative E would restrict activity within 4 miles of leks during the lekking season. Alternative E would apply NSO stipulations on fluid mineral leasing and manage ROW avoidance areas in PPMA and PGMA. Alternative E would also require mitigation for locatable mineral development. PPMA and PGMA would be managed as closed to nonenergy mineral leasing and mineral material disposal. Overall, Alternative E would better protect Greater Sage-Grouse and habitat than Alternatives A, B, or D. Alternative E would allow more management flexibility than Alternative C by using avoidance rather than exclusion areas and continuing to permit livestock grazing in PPMA.

Special Status Species: Cumulative Impacts

Table 4-1 lists the reasonably foreseeable cumulative actions for the CCD. Incremental cumulative impacts on special status species would be similar to those discussed in Cumulative Effects for fish and wildlife, but effects under the alternatives may be more severe because of the rarity of these species.

4.3.7 Wild Horse and Burros

This section discusses impacts on wild horses from proposed management actions of other resources and resource uses. Existing conditions concerning wild horses are described in **Section 3.3.7, Wild Horse and Burros**.

Summary

In general, Alternative A would not provide the management necessary to sustain the thriving natural ecological balance for wild horses and burros in the currently managed HMAs.

Alternative B generally prioritizes development and recreational use while relying on mitigation to reduce, rather than prevent, adverse impacts. Alternative B would result in greater impacts on wild horses and burros than under Alternative A.

Alternative C is the most protective of natural resources (and most beneficial to wild horses and burros) because it involves the least new development, excludes potentially impacting uses, and prioritizes protection and restoration of resources when conflicts among uses occur.

Alternative D management actions focus on the urban interface area. Implementation of specific management actions in this area may limit wild horse

and burro access, but is likely to reduce conflicts between recreation and wild horses and burros, which are high in the urban interface.

Alternative E combines actions from other alternatives and balances limitations on wild horse and burro management with increased flexibility, especially in situations where rangeland health is maintained, thereby mitigating impacts on wild horse and burro management.

Quantitative impacts pertaining to wild horses are displayed in **Table 4-3**, Acreage Impacts within HMAs per Alternative.

Table 4-3
Acreage Impacts within HMAs per Alternative

Management Action	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Motorized Use-Open to Unrestricted Vehicle Use	804,200	2,500	0	0	0
Motorized Use-Limited to Existing Routes	390,500	992,700	597,100	995,200	1,068,900
Motorized Use-Closed to Motorized, limited to Mechanized	0	0	181,700	0	8
Motorized Use-Closed to Motorized and Mechanized	1,300	1,300	311,200	1,300	1,300
ROW Avoidance Areas	0	201,400	48,800	179,600	269,400
ROW Exclusion Areas	320,800	311,100	789,400	311,100	311,100
Lands Available for Disposal	2,400	2,400	0	2,400	2,400
Available for Livestock Grazing	1,196,000	996,500	427,200	996,500	1,070,200
Open to Fluid Mineral Leasing	866,300	685,400	504,200	685,400	752,700
Subject to NSO Stipulation	0	93,900	263,500	186,800	285,800
Subject to CSU Stipulation	0	457,400	311,900	420,900	464,800
Closed to Fluid Mineral Leasing	329,700	311,100	585,800	311,100	317,500
Open for Mineral Material Sales	875,200	626,400	262,500	626,400	600,100

Table 4-3
Acreage Impacts within HMAs per Alternative

Management Action	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Closed for Mineral Material Sales	320,800	370,100	827,500	370,100	470,100
Open for Nonenergy Mineral Leasing	870,900	626,400	262,800	626,400	515,900
Closed to Nonenergy Mineral Leasing	325,000	370,100	827,200	370,100	554,300
Lands Petitioned for Withdrawal from Mineral Entry	0	152,200	30,500	152,300	152,200
VRM I	320,800	311,100	311,100	311,100	311,100
SRMAs	2,500	2,500	0	0	0
ACECs	0	67,900	208,700	10,100	0

Source: BLM GIS 2014a, BLM GIS 2014b

Methods of Analysis

Assumptions

The following assumptions were used to assess the impacts on wild horses and burros:

- The wild horse population will continue to increase through recruitment of foals. Recruitment rates will vary depending on fertility control program and natural mortality.
- Excess wild horses will be removed when monitoring data indicate there is no longer a thriving natural ecological balance or preferably at the point where the next year's recruitment would lead to nonattainment of a thriving natural ecological balance within BLM-administered HMAs.
- Wild horse herds within CCD HMAs will be managed within the AML range through gathers and the selected application of additional population control practices.
- Water is the primary resource associated with wild horse distribution. Water developments can improve wild horse distribution. Furthermore, human-made water developments that employ some type of mechanical device (e.g., windmill and electric pump) can fail and cause horses to go without or go elsewhere for water. The BLM does not have the resources to monitor and maintain water sources reliant upon mechanical devices. If a device were to fail, which is a common event, many horses could perish.

- Fences and other disturbances can restrict wild horse movement and access to water sources and optimal forage. Fences are sometimes necessary to control livestock movement within an HMA, restrict horse distribution to areas inside HMAs, or to protect sensitive resources within HMAs.
- While wild horses and burros may be found on lands outside HMAs, these areas have no forage allocated to wild horses and burros and the BLM has no authority to manage (except to remove) wild horses and burros outside of HMAs.
- Wild horse and burro gather operation scheduling is a product of a national priority process. Factors affecting gather priorities include determinations of excess horses and overpopulations, wild horse and range condition, annual appropriations, litigation and court orders, emergency situations (e.g., disease, weather, or fire), availability of contractors, adoption market, and long-term holding availability for unadoptable excess horses.
- Population growth suppression (e.g., fertility control agents, sterilization, and sex ratio adjustments) can aid in population control, but periodic gathers are still necessary to remove excess wild horses.
- Wild horse and burro distribution will and can vary by season, climatic conditions, water and forage availability, and population size.

Indicators

The following indicators were used to assess the degree of impacts on wild horses and burros:

- Changes in acres
- Changes in available forage and water
- Changes in AML
- Changes in body condition
- Changes in wild horse behavior

Nature and Type of Effects

Impacts on wild horses generally result from activities that affect available forage and water or cause harassment to the wild horses. Forage conditions could generally be affected by surface-disturbing activities and use of forage by livestock. Surface disturbance or restrictions on surface disturbance within individual HMAs could affect forage conditions. Likewise, management actions that disturb or restrict access or reduce disturbance to water resources could also affect wild horses or their habitat.

Management actions that improve or increase the availability of grasses and water will tend to benefit wild horse herds within HMAs. In these areas, wild horses can be managed and viewed with limited impediments on their movement across the landscape. Management actions that substantially alter the landscape and/or increase human disturbances and presence could reduce the wild and free-roaming nature of wild horses by disrupting their use of habitat and impeding normal wild horse behavior.

Healthy uplands, watersheds, and soils would increase the potential for maintenance or an increase of forage and water productivity for wild horses and burros. Management actions and BMPs designed to reduce erosion and maintain or improve soils and vegetative cover and reclaim disturbed areas could increase forage plants and maintain or improve the plant communities thereby improving the habitat for wild horses and burros.

Proper management of springs and riparian areas would help to ensure reliable water sources. Control or eradication of noxious weeds would provide improved forage for wild horses and burros by increasing the potential for the presence and vigor of forage plants.

Protecting special status plants and special status species habitat could directly affect wild horses and burros by limiting access to site-specific areas or preventing forage improvement projects. Conversely, protecting areas that support special status species could prevent activities that inhibit wild horses and burros and could provide cleaner and more dependable water sources for wild horses and burros in the long term.

Wildlife species could compete with wild horses for forage, water, and cover when they occupy the same area. In the long term, wildlife management actions to improve water quality, improve vegetation or habitat conditions, and increase forage production would also benefit wild horses and burros.

Effects of wildland fire on wild horses and burros would vary depending on fire size and intensity, the timing of the fire, and fuel moisture content. Wildland fire would initially displace wild horses and burros, and depending on the proximity of the horses to the fire, wild horses and burros could be stressed, or injured. Wildland fire would remove vegetation and forage over the short term. Over the long term, wildland fire could improve forage production, especially when fire rehabilitation efforts are implemented. Restoring natural disturbance regimes such as fire, and using vegetative treatments to accomplish biodiversity objectives in resilient plant communities, would also benefit wild horses and burros by maintaining productive habitat.

Mineral extraction and energy development could temporarily or permanently remove forage areas for wild horses and burros, depending on the location of the development. Activities associated with exploration and extraction could open the potential for human activity to disturb herds. Activities associated with

mineral development include construction of fences, well pads, roads, pipelines and other facilities for processing. Loss of rangeland and forage could be mitigated by post-mining reclamation. Roads associated with mineral extraction would remove vegetative habitat until or if they were reclaimed. Withdrawal or closure of areas for mineral development would reduce the potential for human-herd interaction and rangeland and forage loss. Protection of resources through mitigation measures, standard operating procedures, and BMPs would preserve and restore range health.

Applying NSO stipulations would prohibit surface occupancy and surface-disturbing activities year-round, reducing the risk of forage degradation and disturbance of wild horses and burros. The NSO stipulation acreages would vary by alternative.

The application of CSU stipulations would mitigate surface-disturbing activities and limit disturbances to wild horses and burros and their habitat. The CSU stipulation acreages would vary by alternative.

Short-term impacts of recreation activities on wild horses and burros include degradation of habitat, introduction and spread of invasive species, loss of forage, and spatial disturbance. Long-term impacts of recreation on wild horses include loss of forage, reduced forage palatability because of dust on vegetation, disturbance and harassment caused by increased levels of human activities, altering traditional use areas, and the potential for recreational opportunities that help foster stewardship of the wild horse and burro herd. Long-term impacts on wild horse and burro distribution and usage patterns would reduce the horses' free-roaming nature.

The short-term impacts of travel within HMAs include degradation of habitat, introduction and spread of invasive species, loss of forage, and temporary displacement of horses. Long-term impacts of motorized use on wild horses and burros include loss of forage, and disturbance and harassment caused by human and vehicle presence. These impacts are reduced when travel is closed or limited to designated trails.

Actions to limit erosion and the spread of weeds would impact wild horses and burros by improving the general health of wild horse and burro habitat in the long term. However, if wild horses and burros were the cause of erosion, changes would be made to AML or their behavior patterns. This could include treatment of other areas that could improve distribution of use.

Short-term impacts from site-specific lands and realty actions such as small land transfers, construction of power lines and pipelines, and other construction activities within ROWs could include the temporary removal of forage and harassment and the displacement of wild horses and burros. Long-term impacts from site-specific lands and realty actions include loss of forage, and disturbance and harassment from increased levels of human activities. Managing ROW

avoidance and exclusion areas would reduce impacts to wild horse and burro habitat by mitigating or excluding surface-disturbing activities. Specific areas managed as ROW avoidance or exclusion areas differ per alternative and are identified below.

Management of wild horses and burros would help ensure healthier viable herds by preventing overpopulation that could lead to overgrazing ranges, which can lead to the loss of desirable forage grasses and replacement by less palatable grasses or unpalatable invasive species, damage to water sources, and increased competition with wildlife.

Managing ACECs increase protection of vegetation/ forage, and provide long-term improvement or maintenance of rangeland habitat quality as a result of special management and use restrictions in these areas.

Continuing to manage WSAs that overlap HMAs would result in direct and indirect impacts. In general, the protections afforded to WSAs such as restrictions on surface-disturbing and other disruptive activities would help maintain and improve vegetation conditions, thereby maintaining or improving the wild horse and burro forage base. Managing an area as a WSA would also restrict some activities that would be beneficial for wild horse and burro management such as vegetative treatments and construction of water facilities.

Interpretation and environmental education could serve as an important tool in fostering understanding and stewardship of wild horse and burro herds.

Management for the following resources would not result in an effect on wild horses and burros: air, geology, tribal interests, and WSRs.

Wild Horse and Burros: Effects from Climate Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under current management, there are no specific management actions identified for climate change. The BLM response to drought conditions would continue on a case-by-case basis in order to ensure sustainability of wild horse and burro herds and rangelands.

Effects under Alternative B

Prioritizing treatments to remove existing threats that may exacerbate the negative effects of climate change on BLM special status species and habitat would increase forage for wild horses and burros in the long term.

Effects under Alternative C

Prioritizing treatments to remove existing threats that may exacerbate the negative effects of climate change on BLM special status species and habitat would increase forage for wild horses and burros in the long-term.

Adaptively managing ecosystems to create connectivity through utilizing ecological studies could promote a healthy rangeland and forage base for wild horses and burros in the long-term unlike Alternative A.

Effects under Alternative D

Impacts would be the same as Alternative B.

Effects under Alternative E

Impacts would be the same as Alternative C.

Wild Horse and Burros: Effects from Soil Resources

Effects Common to All Alternatives

Conservation measures to prevent erosion and other soil degradations are included under all alternatives. Protection of soil indirectly conserves habitat and healthy forage for wild horses and burros, and preventing sedimentation in watercourses can improve water quality. Soil litter, appropriate vegetation, and good infiltration are important to land health and habitat quality. Implementation of BMPs and RAC Standards and Guidelines for soil-disturbing activities and application of reclamation measures will mitigate for soil disturbance and encourage healthy forage and habitat.

Effects under Alternative A

Alternative A would limit OHV use to designated roads and trails in highly erosive soil areas. This approach promotes a healthy rangeland and forage base for wild horses and burros but does not pro-actively prevent erosion.

Effects under Alternative B

Alternative B would apply an erosion control plan to projects on slopes, would apply soil amendments to minimize soil disturbance, and apply a CSU stipulation on highly erosive soils. These management approaches would diminish erosion and soil damage and protect water supply, forage, and habitat for wild horses and burros more than current management.

Effects under Alternative C

Effects under Alternative C would be similar to those described for Alternative B.

Effects under Alternative D

Effects under Alternative D would be similar to those described for Alternative B. Alternative D would also mandate re-seeding of disturbed soils to minimize

erosion. Reseeding would increase forage for wild horses and burros in the long term.

Effects under Alternative E

Effects under Alternative E would be similar to those described for Alternative D.

Wild Horse and Burros: Effects from Water Resources

Effects Common to All Alternatives

Effective watershed management minimizes erosion and maintains hydrologic flow. This results in maintaining healthy wild horse and burro forage and habitat. All alternatives have the goals of improving water supply and maintaining water quality and floodplains in accordance with federal, state, and local laws that benefit wild horses and burros.

Acquisition and development of new sources and protection of watersheds and existing sources, quantity, quality, and access would generally directly benefit wild horses and burros. More dispersed water sources would prevent wild horses and burros from concentrating around current water sources and would allow for changes in utilization patterns, which may result in an increase in available forage. Plant species, that require mycorrhizal crusts or little disturbance as well as the wildlife species that use these habitats may be adversely impacted by this alternative as grazing and the disturbances associated with grazing would impact a greater area.

Effects under Alternative A

Alternative A would limit BLM-authorized activities in degrading watersheds and specific portions of urban watersheds at the most immediate risk of degradation. Alternative A would also limit OHV use in riparian areas. These approaches would protect wild horse and burro water supply in these local areas and limits harassment from OHVs, but would provide limited oversight of watershed health and water quality on a regional scale.

This alternative does not specify management for importation and exportation of water in the district. Importation and exportation under Alternative A would be least beneficial to wild horses and burros if the exported water came from a critical water source for the herd.

Effects under Alternative B

Developing water sources and acquiring water rights to benefit the resources on BLM-administered lands would be beneficial to wild horses and burros if it occurs in areas within HMAs.

Alternative B would place restrictions on water importation and exportation that would ensure that exported water would not come from critical water sources for individual herds.

Effects under Alternative C

Alternative C would place restrictions on water importation and exportation that would ensure that exported water would not come from critical water sources for individual herds. In addition, Alternative C would prohibit surface disturbing activities within source water protection zones, indirectly protecting water quality and sources for wild horses and burros.

Effects under Alternative D

Alternative D would place restrictions on water importation and exportation that would ensure that exported water would not come from critical water sources for individual herds. In addition, Alternative C would restrict surface disturbing activities within source water protection zones, indirectly protecting water quality and sources for wild horses and burros.

Effects under Alternative E

Impacts would be the same as under Alternative D.

Wild Horse and Burros: Effects from Vegetation Resources

Effects Common to All Alternatives

Range management actions to promote land health, such as seedings and land treatments, would occur under all alternatives. Land treatments would facilitate the maintenance of habitats in various stages of shrub or understory condition. This would provide a range of forage for wild horses and burros.

The spread of noxious and invasive weeds decreases wild horse and burro forage diversity and production and reduces water quality, thus diminishing a healthy range. Weeds out compete native species and can create monocultures that are more prone to wildfire. Weed treatments using integrated pest management would be applied under all alternatives. These treatments may use chemical, physical, or biological means to reduce competition and improve native species diversity. Although weed treatments generally improve the forage base in the long term, short-term disturbances would occur. Treatments, especially mechanical treatments, would cause disturbance and loss of cover, causing wild horses and burros to temporarily avoid treated areas.

Habitat restoration projects would continue in the planning area under all alternatives, with long-term benefits of a sustained forage base for horses and burros. Vegetation could be managed to improve forage, and impacts on wild horses and burros from vegetation management would likely be minimal.

Restoration of riparian areas would benefit wild horse and burro populations through water availability and improved habitat condition. However, should management require increased fences to protect vegetation during restoration, this could limit wild horse and burro movement and access to riparian areas and reduce water availability. This could result in potential need for reduction of

wild horses and burro numbers within an HMA in order to meet vegetation objectives.

The shortest minimum rest time under the alternatives is two years. In the long term, resting treated areas would enhance vegetation by allowing seedlings to establish, resulting in a sustained forage base. Encroachment of weeds into HMAs reduces the availability of preferred forage for wild horses and burros.

Actions to prevent and control invasive and noxious weeds using integrated weed management techniques could directly affect wild horse and burro grazing in the short term if wild horses and burros are excluded in the treatment areas until revegetation has taken place. Control, reduction, and eradication of noxious weeds would provide the native plant community an opportunity to improve and maintain resilience. Wild horses and burros would benefit from healthy plant communities as they are more diverse and productive, and would provide more forage and sustainability.

Effects under Alternative A

Impacts would be the same as identified under *Effects Common to All Alternatives*.

Effects under Alternative B

Alternative B includes vegetation treatments for rangeland restoration, and aim to maximize ecological site potential to establish desired future condition, to benefit land health. Revegetation efforts would use plant species that have high success rates, not necessarily native species, promote maintenance of ecological integrity, and aim to restore depleted understory vegetation. All these approaches would benefit wild horses and burros by maintaining and restoring habitat, more than current management.

Effects under Alternative C

For rehabilitation projects, Alternative C promotes use of native plant material only and restoration techniques to establish desired plant communities. While native plant material would provide optimal forage for wild horses and burros, it may take longer for the native grasses to produce and be available for wild horse and burro consumption.

Effects under Alternative D

Impacts would be the same as identified under *Effects Common to All Alternatives* and Alternative B.

Effects under Alternative E

Impacts would be the same as identified under *Effects Common to All Alternatives* and Alternative B.

Wild Horse and Burros: Effects from Fish and Wildlife Management

Effects Common to All Alternatives

Management designed to maintain and improve big game habitat and cover would indirectly impact wild horses and burros by providing a solid forage base and range within HMAs.

Authorizing water developments to specifically exclude wild horses and burros would reduce opportunities for wild horses and burros during times of stress (e.g., fire or drought) and, depending on the distribution and quantity of other water sources, wild horses and burros could focus their use to other areas necessitating a lower AML

Effects under Alternative A

Under Alternative A, direct impacts on wild horses and burros from wildlife management would be limited.

Effects under Alternative B

Under Alternative B, fences that may inhibit big game movement would be evaluated on a case-by-case basis. If changes to fencing were required, it could impact the free-roaming nature of wild horses and burros.

Management of priority habitat as a ROW avoidance area may limit conflict in this area with wild horses and burros.

Management actions designed to restrict disturbance to big game indirectly restricts disturbance to wild horses and burros.

Effects under Alternative C

Under Alternative C, construction of fences that would conflict with big game movement would be prohibited. This would benefit the free-roaming nature of wild horses and burros.

Management of priority habitat as a ROW avoidance area may limit conflict in this area with wild horses and burros.

In general, actions under Alternative C that would limit mineral and energy use in sensitive wildlife habitat would also limit disturbance of forage and conflicts with wild horses and burros in these areas.

Management actions designed to prohibit disturbance to big game indirectly prohibits disturbance to wild horses and burros.

Effects under Alternative D

Management actions designed to restrict disturbance to big game indirectly restricts disturbance to wild horses and burros.

Effects under Alternative E

Under Alternative E, fences in big game movement corridors would need to be built in a manner that would not obstruct movement. This would benefit the free-roaming nature of wild horses and burros.

Impacts of closing Carson wandering skipper habitat to grazing would be as described under Alternative B.

Management actions designed to prohibit disturbance to big game indirectly prohibits disturbance to wild horses and burros.

Wild Horse and Burros: Effects from Special Status Species Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under Alternative A, impacts from special status species management would be minimal.

Effects under Alternative B

Actions to improve PPMA/PGMA habitat (85,500 acres within HMAs) would result in some site-specific limitations on wild horses and burros, should for example, exclosures be imposed. However, actions to improve PPMA/PGMA habitat would improve wild horse and burro forage base in the long-term.

Actions to improve habitat conditions would also improve forage in the long term by removing encroaching conifers and reducing catastrophic fire risk. Restrictions on surface disturbing activities would limit conflicts in PPMA with wild horses and burros.

Effects under Alternative C

Alternative C would prohibit the use of prescribed fire in PPMA and PGMA. This would take away a tool that could help reduce fire risk and impacts on wild horses and burros as stated in *Nature and Type of Effects*.

Draining water developments when not in use would limit optional water sources for wild horses and burros but would also reduce the risk of an outbreak of West Nile Virus, which could be lethal to wild horses and burros.

Effects under Alternative D

Alternative D includes habitat improvement projects such as removing encroaching junipers in PPMA and PGMA, improving forage quality, and reducing long-term fire risk in these areas (85,500 acres within HMAs).

Restrictions on disturbance and impacts would be similar to that described under Alternative B. Alternative D would place timing limitations within 4 miles of active leks. This would reduce disturbance of wild horses and burros.

NSO stipulations in PPMA would limit impacts from fluid mineral leasing, exploration, and development on wild horses and burros in this area.

Draining water developments when not in use would limit optional water sources for wild horses and burros but would also reduce the risk of an outbreak of West Nile Virus.

Effects under Alternative E

Impacts would be similar to those under Alternative D.

Wild Horse and Burros: Effects from Wild Horse and Burro Management

Effects Common to All Alternatives

All alternatives identify the need to maintain AMLs within HMAs and would use various tools to meet that need. Gathering and implementing population growth suppression tools would help prevent impacts from overpopulation of herds and help ensure adequate forage, water, and overall habitat condition for wild horses and burros in the long-term. Water provided to wild horses and burros during times of stress (e.g., fire or drought) would ensure herd viability. Reverting Horse Mountain and Tule Ridge/Mahogany Flat HMAs to HA status would free BLM staff labor hours to focus management on HMAs that have concentrated uses or resource issues. Additional management would increase the likelihood that wild horse and burro herds could be maintained at thriving natural ecological balance.

Effects under Alternative A

Alternative A would continue to use resources to manage wild horses and burros in HMAs that do not support viable populations or have adequate water sources. Managing these HMAs an inefficient way to manage wild horses and burros that could be better used protecting the range and thriving viable horse populations. These HMAs are small in size; therefore the horses continually use areas outside of the HMAs as part or all of their habitat.

Effects under Alternative B

HMAs that do not contain one or more of four essential habitat components (e.g., forage, water, cover, and space) in sufficient quantities to sustain wild horse and burro use over the long term would be reverted back to HA status under this alternative. This management action would allow for efficient management of viable wild horses and burros on the range. However, if conditions change, all or part of an HA may be reconsidered for designation as an HMA through the land use planning process.

Completing a carrying capacity analysis would allow the BLM to adjust AML's based on current land health and water sources. Adjusting AML would help ensure healthier herds by preventing overpopulation that could lead to overgrazing ranges, damage to riparian areas, and increased competition with domestic stock and other wildlife.

Under Alternative B, the BLM would manage a non-reproducing herd within the Lahontan HMA and arrangements would be made with Lahontan State Park to allow horses access to water within the park. By maintaining a non-reproducing herd and coordinating with the state a viable herd would be able to be managed that the range could support and BLM resources could maintain.

Maintaining current MOUs and developing interagency and interoffice MOUs would standardize management and reduce the potential for possible interagency conflicts regarding proper management. This would also facilitate the dissemination of information and innovative management practices among agencies.

Effects under Alternative C

HMA's that do not contain one or more of four essential habitat components (e.g., forage, water, cover, and space) in sufficient quantities to sustain wild horse and burro use over the long term would be reverted back to HA status under this alternative. This management action would allow for efficient management of viable wild horses and burros on the range. However, if conditions change, all or part of an HA may be reconsidered for designation as an HMA through the land use planning process. Completing a carrying capacity analysis would allow the BLM to adjust AML's based on current land health and water sources and the IBLA ruling. Adjusting AML would help ensure healthier herds by preventing overpopulation that could lead to overgrazing ranges, damage to riparian areas, and increased competition with domestic stock and other wildlife. Flexibility and numerical ranges in management options, and allowing adjustments based on observed conditions would generally be better than rigidity because wild horse and burro herds are dynamic units.

Implementing a population control program within HMA's would provide an alternative tool to reduce the number of excess wild horses on a case-by-case basis; however, gathering some excess wild horses will likely still be needed. Reducing the population growth rates of horses by using population control strategies would provide for healthier herds of animals by limiting the stress of continual pregnancy on the mares. This would also hold true for any non-breeding herds with geldings as they would not be exerting extra energy fighting to control mares. Sterilized mares would also be in better condition because energy would not be used raising a foal. Another benefit to the wild horses and burros would be less stress from being gathered as the gathers would be scheduled farther apart due to horses remaining within the AML range for a longer period of time. The action would also result in fewer wild horses and

burros being placed in short- or long-term holding or the adoption and sale programs over the next 5 to 10 years.

Maintaining current MOUs and developing interagency and interoffice MOUs would standardize management and reduce the potential for any possible interagency conflicts regarding proper management. This would also facilitate the dissemination of information and innovative management practices among agencies.

Effects under Alternative D

HMA that do not contain one or more of four essential habitat components (e.g., forage, water, cover, and space) in sufficient quantities to sustain wild horse and burro use over the long term would be reverted back to HA status under this alternative. This management action would allow for efficient management of viable wild horses and burros on the range. However, if conditions change, all or part of an HA may be reconsidered for designation as an HMA through the land use planning process.

Completing a carrying capacity analysis would allow the BLM to adjust AMLs based on current land health and water sources. Adjusting AMLs would help ensure healthier herds by preventing overpopulation that could lead to overgrazing ranges, damage to riparian areas, and increased competition with domestic stock and other wildlife.

Implementing a population control program within HMAs would provide an alternative tool to reduce wild horse numbers from exceeding AML on a case-by-case basis. Reducing the population growth rates of horses by using population control strategies would provide for healthier herds of animals by limiting the stress of continual pregnancy on the mares. This would also hold true for any non-breeding herds with geldings as they would not be exerting extra energy fighting to control mares. Sterilized mares would also be in better condition because energy would not be used raising a foal. Another benefit is that wild horses and burros would experience less stress from being gathered because gathers would be scheduled less frequently. The action would also result in fewer wild horses and burros being placed in short- or long-term holding or the adoption and sale programs over the next 5 to 10 years.

Maintaining current MOUs and developing interagency and interoffice MOUs would standardize management to prevent the potential for possible interagency conflicts regarding proper management. This would also facilitate the dissemination of information and innovative management practices among agencies.

Effects under Alternative E

HMA that did not contain one or more of four essential habitat components (e.g., forage, water, cover, and space) in sufficient quantities to sustain wild horse and burro use over the long term would be reverted back to HA status

under this alternative. This management action would allow for efficient management of viable wild horses and burros on the range. However, if conditions change, all or part of an HA may be reconsidered for designation as an HMA through the land use planning process.

Completing a carrying capacity analysis would allow the BLM to adjust AMLs based on monitoring current land health and water sources. Adjusting AML would help ensure healthier herds by preventing overpopulation that could lead to overgrazing ranges, damage to riparian areas, and increased competition with domestic stock and other wildlife.

Implementing a population control program within HMAs would provide an alternative tool to reduce wild horse numbers from exceeding AML on a case-by-case basis. Reducing the population growth rates of horses by using population control strategies would provide for healthier herds of animals by limiting the stress of continual pregnancy on the mares. This would also hold true for any non-breeding herds with geldings as they would not be exerting extra energy trying to breed the mares. Sterilized mares would also be in better condition because energy would not be used raising a foal. Another benefit is that wild horses and burros would suffer less stress from being gathered because gathers would be scheduled less frequently. The action would also result in fewer wild horses and burros being placed in short- or long-term holding or the adoption and sale programs over the next 5 to 10 years.

Alternative E would increase AMLs contingent upon arrangements being made with Lahontan State Park to allow horses access to water within the park. By coordinating with the state a viable wild horse herd would be able to be managed that the range and water sources could support.

Maintaining current MOUs and developing interagency and interoffice MOUs would standardize management to prevent individual management plans that are at odds with one another and reduce any possible interagency conflicts regarding proper management. This would also facilitate the dissemination of information and innovative management practices among agencies.

Wild Horse and Burros: Effects from Wildland Fire Ecology and Management

Effects Common to All Alternatives

Wildland fire could impact wild horses and burros in the short and long-term. Periodic fires may reduce dense understory and change nutrient composition in soils. Fire may convert late-successional vegetation to earlier stage, increasing forage for wild horses and burros. However, fire also causes loss of habitat, increases potential for erosion, and increased sedimentation and water temperatures in aquatic habitats from removal of upland vegetation. Fire can also cause long-term alternations of habitat, particularly for sagebrush habitats, which are slow to recover from fire, and vulnerable to competition from

invasive weeds, which results in a loss of forage for wild horses and burros. Mortality of wild horses and burros can also occur from fires.

Effects under Alternative A

Alternative A would manage wildfire with categories A, B C, and D, each with target fire suppression goals to protect property and resources. Fire suppression would protect special status species habitat in areas threatened by fire. This would indirectly protect wild horse and burro forage and habitat, but could also contribute to more damaging fires if dense understory vegetation builds up.

Effects under Alternative B

Alternative B would develop fire management plans to guide response to wildfire and prioritize suppression activities, and improve ESR. Alternative B includes provisions to prevent cheatgrass and other invasive species from dominating burned areas and altering the natural fire regime by re-establishing appropriate species/subspecies. This approach would provide healthier forage and habitat for wild horses and burros more than current management.

Effects under Alternative C

Management under Alternative C would be similar to Alternative B, with more focus on protecting sensitive biological, cultural, and other natural resources, and use of native species for revegetation. This alternative would do the most to protect wild horse and burro forage and habitat from fire damage.

Effects under Alternative D

Management under Alternative D would be similar to Alternative B, but would focus on the urban interface zone. This would directly impact wild horses and burros in the few areas where wild horses and burros travel within that zone.

Effects under Alternative E

Management under Alternative E would be similar to Alternative B.

Wild Horse and Burros: Effects from Cultural Resources Management

Effects Common to All Alternatives

In general, management actions designed to protect cultural resources are localized and minimally impact wild horses and burros. Limiting surface disturbance activities near cultural sites would protect forage for wild horses and burros.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Wild Horse and Burros: Effects from Paleontological Resources Management

Effects Common to All Alternatives

Management for paleontological resources and protection of paleontological ACECs would protect wild horse and burro forage, and minimize vegetation loss and erosion. Promoting public visitation to areas of paleontological interest or importance could impact wild horse and burro range, depending on the numbers of visitors to areas. Wild horses and burros could be disturbed, plants may be trampled, and wild horses and burros may avoid areas of high visitation, but these impacts would be minor and localized.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Wild Horse and Burros: Effects from Visual Resources Management

Effects Common to All Alternatives

Impacts on wild horses and burros would vary, depending on the number of acres identified by VRM class. In general, management for VRM Class I or II designated areas would allow fewer intrusions to the landscape resulting in fewer impacts on wild horses and burros and their range. Overall, impacts are expected to be minor and localized.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Wild Horse and Burros: Effects from Caves and Cave Resource Management

Effects Common to All Alternatives

In general, management actions to protect caves would not have any effect on wild horses or burros. Efforts to inform or educate the public about caves could increase visitation and adversely disturb surrounding wild horse and burro habitat. Impacts would be minor and localized.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Wild Horse and Burros: Effects from Forestry and Woodland Product Management

Effects Common to All Alternatives

Harvesting of forest products would impact wild horses and burros due to noise, surface disturbance, removal of trees, and loss or fragmentation of the range habitat and cover. These activities are relatively limited in the planning area. These negative impacts would be short term and may improve the forage base in the long term.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Wild Horse and Burros: Effects from Livestock Grazing Management

Effects Common to All Alternatives

All alternatives would comply with standards and guidelines for livestock grazing, and manage allotments toward meeting Rangeland Health Standards. Allotments meeting standards provide superior habitat, because they have healthier vegetation, more native species, and less soil damage. All alternatives would rest burned areas from livestock grazing for a minimum of two growing seasons, and would not allow livestock grazing near springs, meadows, streams, or aspen areas. While this would exclude livestock and wild horses and burros in the short-term, it would provide a healthy forage base in the long-term.

Effects under Alternative A

Under current management, existing range management programs and closures would continue (see **Table 2-1**). These programs promote rangeland health and make provisions to improve habitat for wildlife, and wild horses and burros, but some lands do not meet rangeland health standards and also likely provide poor habitat due to loss of understory cover and forage.

Lack of restriction on continuous year-round grazing may contribute to failure of allotments to meet land health standards if forage resources become limited and adjustments are not made to grazing practices, with long-term impacts on the health of the wild horse and burro forage base.

Effects under Alternative B

Alternative B would result in approximately 996,500 acres available for livestock grazing within HMAs.

Continuous grazing would not be allowed in any one allotment, reducing conflicts with wild horses and burros and limiting impacts on land health in any one area.

Under Alternative B, retaining allotments overlapping the Pinenut HMA would retain the potential for conflict between wild horses and livestock, particularly in drought years, when forage would be more limited.

Under Alternative B, allotments would be discontinued where management changes have failed to stop decreasing in ecological function due to livestock. This action would increase the amount of forage and water available to wild horses and burros.

Effects under Alternative C

Alternative C would result in approximately 427,200 acres (64 percent reduction from Alternative A) available for livestock grazing within HMAs. In addition, under Alternative C, reduction in AUMs may be required and grazing utilization levels would be reduced to 27 percent of current levels on allotments not meeting land-health standards. If the reduced utilization level did not improve the ecological condition of allotments prior to the next periodic review, further reductions could be made based on monitoring. These provisions would improve the health of allotments that were not meeting Rangeland Health Standards due to overgrazing, and could provide more forage for wild horses and burros.

Under Alternative C, livestock grazing would be unavailable on allotments once they become vacant. In particular, livestock grazing in the Pinenut HMA would no longer be available as allotments become vacant, reducing conflicts between wild horses and livestock. Areas containing Greater Sage-Grouse priority or general habitat would not be available for grazing. In addition, no continuous grazing would be allowed on any allotment. These actions would all increase the amount of forage and water available to wild horses and burros.

Reducing grazing on BLM-administered lands could reduce erosion caused by high livestock use, improving upland, riparian and wetland habitat at a faster rate. Conflicts between livestock and wild horses, burros, and wildlife would also be reduced however, eliminating grazing would allow vegetation to build up faster on rangelands and may increase susceptibility to fire and disease and not improving rangeland health in the long term.

Effects under Alternative D

Alternative D would result in approximately 996,500 acres available for livestock grazing (the same as Alternative B) within HMAs. Under Alternative D, grazing would continue to be managed at existing levels, with re-examination based on monitoring and land health assessments conducted during the periodic review process.

Continuous grazing would be permitted with impacts as described under Alternative B.

Under Alternative D, as under Alternative B, livestock grazing would be unavailable in allotments where management changes have been implemented and the allotment is still decreasing in ecological function with impacts as discussed under B. Under D, however, discontinuation is extended to areas

where livestock use is incompatible with urban uses which could increase the forage base and water sources for wild horses and burros in the WUI interface.

Impacts from making the Pinenut allotments unavailable would be as described under Alternative C.

Effects under Alternative E

Alternative E would result in approximately 1,070,200 acres available for livestock grazing (similar to Alternatives B and D) within HMAs. Under Alternative E, grazing would continue to be managed at existing levels, with re-examination based on monitoring and land health assessments during a periodic review process. Impacts would be similar to Alternative A except, those impacts from retaining allotments in Pinenut HMA would be as discussed under Alternative B.

Wild Horse and Burros: Effects from Geology and Mineral Management

Effects Common to All Alternatives

All alternatives would make mineral resources (leasable, locatable, salable) available for extraction or development but with differing open acres, stipulations and conditions of approval to protect other resources. Impacts on wild horses and burros from mineral exploration and development generally occur from surface disturbance causing loss of forage and wild horse and burro range, as well as disturbances to individuals from noise and activity associated with construction, and operation of facilities and roads.

Mineral material sites specifically would result in loss of wild horse and burro forage and long-term disturbance (e.g., surface, noise, and activity) in the vicinity of the sites as long as they remain open and active. Sites that require new access roads would also result in loss of forage and fragmentation of the range. Control methods for the reduction of weeds would result in short-term impacts on soil resources from compaction or ripping by heavy machinery, introduction of herbicides, or heavy grazing methods to remove unwanted vegetation within treatment areas. These areas would eventually benefit from such treatments as vegetation composition of native species would be restored.

Effects under Alternative A

Approximately 866,300 acres would continue to be open to fluid mineral development in HMAs under Alternative A. The types of impacts would be the same as identified under *Effects Common to All Alternatives*.

The BLM would continue to manage approximately 870,900 acres as open to nonenergy leasable development in HMAs under Alternative A. The types of impacts would be the same as identified under *Effects Common to All Alternatives*.

The BLM would manage approximately 875,200 acres as open to mineral material sales within HMAs under Alternatives A. The types of impacts would be the same as identified under *Effects Common to All Alternatives*.

Effects under Alternative B

The BLM would manage approximately 685,400 acres as open to fluid mineral leasing within HMAs under Alternative B. Out of the 685,400 acres, 93,900 acres would be subject to NSO stipulations and 457,400 acres would be covered under CSU stipulations.

NSO stipulations would place stringent restrictions on fluid mineral leasing and surface-disturbing activities decreasing loss of forage and disturbance of wild horses and burros. The CSU stipulation would only require mitigating measures for fluid mineral leasing and could present the opportunity for activities harmful to the herd, however the stipulation would provide for fewer impacts on wild horses and burros than under Alternative A.

The BLM would manage approximately 626,400 acres as open to mineral material sales within HMAs under Alternatives B. The types of impacts would be the same as identified under *Effects Common to All Alternatives*.

The BLM would manage approximately 626,400 acres as open to nonenergy leasable development within HMAs under Alternatives B (the same as under Alternative A). The types of impacts would be the same as identified under *Effects Common to All Alternatives*.

Effects under Alternative C

The BLM would manage approximately 504,200 acres (42 percent decrease in acreage than under Alternative A) as open to fluid mineral leasing within HMAs under Alternative C. Out of the 504,200 acres, 260,500 acres would be subject to NSO and 311,900 acres would be covered under CSU stipulations. Impacts would be similar to those identified under Alternative B. This alternative provides for the fewest impacts on wild horses and burros from fluid mineral leasing.

The BLM would manage approximately 262,900 acres as open to nonenergy leasable development within HMAs under Alternatives C (70 percent decrease compared to Alternative A). The types of impacts would be the same as identified under *Effects Common to All Alternatives*.

The BLM would manage approximately 262,500 acres as open to mineral material sales within HMAs under Alternative C (70 percent decrease compared to Alternative A). The types of impacts would be the same as identified under *Effects Common to All Alternatives*.

Effects under Alternative D

The BLM would manage approximately 685,400 acres (21 percent decrease in acreage compared to Alternative A) as open to fluid mineral leasing within HMAs under Alternative D. Out of the 685,400 acres, 186,800 acres would be subject to NSO and 420,900 acres would be covered under CSU stipulations. Impacts would be the similar to those identified under Alternative B.

The BLM would manage approximately 626,400 acres as open to nonenergy leasable development within HMAs under Alternatives D (the same as under Alternative B). The types of impacts would be the same as identified under *Effects Common to All Alternatives*.

The BLM would manage approximately 626,400 acres as open to mineral material sales within HMAs under Alternatives D (the same as under Alternative B). The types of impacts would be the same as identified under *Effects Common to All Alternatives*.

Effects under Alternative E

The BLM would manage approximately 752,700 acres (13 percent decrease in acreage compared to Alternative A) as open to fluid mineral leasing within HMAs under Alternative E. Out of the 752,700 acres, 285,800 acres would be subject to NSO and 464,800 acres would be covered under CSU stipulations. Impacts would be the similar to those identified under Alternative B.

The BLM would manage approximately 515,900 acres as open to nonenergy leasable development within HMAs under Alternatives E (41 percent decrease compared to Alternative A). The types of impacts would be the same as identified under *Effects Common to All Alternatives*.

The BLM would manage approximately 600,100 acres as open to mineral material sales within HMAs under Alternative E (31 percent decrease compared to Alternative A). The types of impacts would be the same as identified under *Effects Common to All Alternatives*.

Wild Horse and Burros: Effects from Recreation and Visitor Services

Effects Common to All Alternatives

Direct impacts from recreation management actions include loss or modification of habitat from constructing recreational facilities, including roads. Recreation management actions that result in increased human presence could have localized disturbance impacts on wild horses and burros from dispersed activities such as hiking, biking, camping, fishing, hunting, and sightseeing. Promoting scientific research and educational outreach would also increase public awareness and visitation. Impacts could include disruption of wild horses and burros, interference during foaling season, and damage to forage. Commercial, competitive, and group recreational activities could have greater impacts, but effects would be minimized through use restrictions and mitigation

measures. Increased human-wild horse and burro interaction could result in physiological stress and or harassment of wild horses and burros.

OHV use is the most damaging form of recreation to wild horses and burros, as a result of vegetative trampling and disturbance. OHV management actions that result in increased OHV use would cause localized impacts on wild horses and burros. Impacts could include stress and displacement of wild horses and burros, destruction of plants, and degradation of habitat or sedimentation of waterways. OHV high-use areas (e.g., Bedell Flat) can also alter the use patterns of wild horses and burros.

Effects under Alternative A

Under this alternative, the BLM would continue to manage 2,520 acres of the Walker Lake SRMA within the Wassuk HMA. Managing lands as SRMAs could encourage additional use of these lands and thus increase disturbances to wild horses and burros; however, disruption of wild horses and burros in other HMAs may be reduced by focusing recreationalists in specific areas. Under SRMAs, management actions can reduce the impacts of recreational activities, and adverse impacts can be monitored and addressed.

Effects under Alternative B

In addition to continuing to manage the Walker Lake SRMA within the Wassuk HMA, Alternative B would also establish 3 ERMAs that would overlap HMAs. 1,888 acres of the Middlegate ERMA would fall within the Desatoya HMA and 502,013 acres of the Pine Nut ERMA would fall within the Pine Nut HMA. ERMAs generally provide less funding for public access and improvements than SRMAs, and thus may have less visitation and fewer impacts on wild horses and burros. The Mina ERMA, however, promotes long distance trail riding for ATVs and UTVs through three HMAs (Marietta, Montgomery Pass and Pilot Mountain) increasing the risk of displacement and harassment of wild horses and decreasing wild horse forage availability than under Alternative A.

Effects under Alternative C

The BLM would continue to manage the Walker Lake SRMA under Alternative C, however the Wassuk HMA would be reverted back to an HA and there would be no impacts on wild horses and burros. Alternative B would also establish 5 ERMAs that would overlap HMAs. 14,325 acres of the Dry Valley and Virginia Mountain ERMAs would fall within the Flanigan HMA; 1,937 acres of the Dry Valley ERMA would fall within the Ft. Sage HMA; 125,352 acres of the Mina ERMA would fall within the Garfield Flat HMA; 64,607 acres of the Mina ERMA would fall within the Montgomery Pass HMA; and 93,432 acres of the Pine Nut and Singatse ERMAs would pass within the Pine Nut Mountains HMA.

Alternative C would minimize development of recreational facilities that attract visitors and would place the most limitations on OHV use, resulting in the fewest impacts on wild horses and burros from recreational use.

Effects under Alternative D

Under Alternative D, the Walker Lake SRMA would be managed as closed and impacts resulting from this SRMA would no longer affect the wild horses and burros within the Wassuk HMA. In addition 50,213 acres of the newly established Pine Nut ERMA would overlap with the Pine Nut Mountains HMA. Impacts would be similar to those described under Alternative B.

Effects under Alternative E

Alternative E would establish 6 ERMA's that would overlap HMA's. 1,888 acres of the Middlegate ERMA would fall within the Desatoya HMA; 14,325 acres of the Dry Valley and Virginia Mountain ERMA's would fall within the Flanigan HMA; 1,937 acres of the Dry Valley ERMA would fall within the Ft. Sage HMA; 125,352 acres of the Mina ERMA would fall within the Garfield Flat HMA; 64,607 acres of the Mina ERMA would fall within the Montgomery Pass HMA; and 93,432 acres of the Pine Nut and Singatse ERMA's would pass within the Pine Nut Mountains HMA. Impacts would be similar to those described under Alternative B.

Wild Horse and Burros: Effects from Comprehensive Travel and Transportation Management

Effects Common to All Alternatives

Under all alternatives, roads decrease wildlife habitat quality. Roads and trails increase human-wild horse and burro interactions and can displace and stress animals, cause direct mortality from collisions, and alter home range. Flooding and erosion from poorly maintained roads and trails can also degrade wild horse and burro water sources.

Effects under Alternative A

OHV use would be the most detrimental to wild horses and burros under Alternative A. Under Alternative A, 804,200 acres would continue to be open, 390,500 acres limited, and 1,300 acres closed to motorized and mechanized OHVs within HMAs.

Effects under Alternative B

Under Alternative B, the BLM would manage 2,500 acres as open, 992,700 acres as limited, and 1,300 acres as closed to motorized and mechanized OHVs within HMAs. This alternative would significantly reduce impacts from OHV use compared to current management.

Effects under Alternative C

OHV use would be the most restricted under this alternative. The BLM would manage 1,300 total acres as open (no open acres within HMAs), 597,100 acres as limited, 311,200 acres as closed to motorized and mechanized OHVs, and 181,700 acres as closed to motorized but limited to mechanized OHVs within HMAs.

Effects under Alternative D

Alternative D would be more effective at reducing impacts from OHV use than Alternative A by further restricting OHV permitted use areas. Under this alternative, the BLM would manage 1,300 acres as closed to motorized and mechanized OHVs, 995,200 acres as limited, and 22,700 total acres as open (no open acres within HMAs).

Effects under Alternative E

Under Alternative E, the would manage 71,200 total acres as open, 1,300 acres as closed to motorized and mechanized travel, and 1,068,900 acres as limited to existing roads. Impacts would be similar to those under Alternative D, but the BLM would manage 55,700 total acres as open to OHV travel (no open acres within HMAs). Less protection would be provided for wild horses and burros.

Wild Horse and Burros: Effects from Lands and Realty*Effects Common to All Alternatives*

Impacts on wild horses and burros from lands and realty management actions include forage loss and wild horse range degradation due to surface disturbance locally from construction of power lines, pipelines, roads, and other infrastructure. Implementing mitigation measures would reduce the extent of these impacts.

Effects under Alternative A

The BLM would continue to exclude 320,800 acres from ROW development within HMAs under Alternative A. Habitat fragmentation would continue outside of the exclusion areas, affecting wild horses and burros, which need areas of contiguous habitat to sustain populations. Under this Alternative, 2,400 acres within HMAs would be identified for disposal. Impacts from disposal include loss of forage and habitat for wild horse and burro herds.

Effects under Alternative B

Under Alternative B, 201,400 acres within HMAs would be set aside as ROW avoidance areas, including implementation of mitigation measures to avoid or reduce impacts on wild horse and burro habitat. ROW exclusion areas and lands identified for disposal would remain at similar levels to Alternative A. Overall; management under Alternative B would be more protective of special status species than current management because of the establishment of avoidance areas.

Effects under Alternative C

Under Alternative C, 789,400 acres would be managed as ROW exclusion areas and 48,800 acres as avoidance areas within HMAs. In addition, no BLM-administered land would be identified for disposal under this alternative. This alternative would provide the most protection to wild horses and burros from lands and realty actions within HMAs.

Effects under Alternative D

The impacts on wild horses and burros under Alternative D would be similar to Alternative B. Under Alternative D, 179,600 acres are identified as avoidance areas and 311,100 acres are identified for exclusion from ROW development within HMAs. The same number of acres would be identified for disposal within HMAs under Alternative D as under current management. This alternative would protect wild horses and burros and their range from ROW development more than Alternative A.

Effects under Alternative E

Under Alternative E, the acreage within HMAs identified for ROW exclusion would be similar compared to current management (311,100 acres exclusion). Wild horses and burros in ROW exclusion and avoidance areas would be protected from habitat degradation and other impacts. The same number of acres is identified for disposal within HMAs under Alternative E as under current management.

Wild Horse and Burros: Effects from Renewable Energy*Effects Common to All Alternatives*

Renewable energy development could impact wild horses and burros by removing vegetation for construction of wind turbines, solar panels or towers, power lines, roads, and other facilities, which fragment the range and remove vegetation comprising wild horse and burro range. Human disturbances from construction and operation of facilities, including noise, movement, and vibrations, would cause disruption of wild horse and burro behavior. BMPs, stipulations, and mitigation measures applied as part of these projects would limit impacts to some degree. Control methods for the reduction of weeds would result in short-term impacts on soil resources from compaction or ripping by heavy machinery, introduction of herbicides, or heavy grazing methods to remove unwanted vegetation within treatment areas. These areas would eventually benefit from such treatments as vegetation composition of native species would be restored.

Effects under Alternative A

Under current management, no avoidance areas for wind energy have been designated, and approximately 102,500 acres within HMAs are designated as variance areas for solar projects. Variance areas allow development, but require provisions to protect resources in the area. Outside variance areas, utility-scale solar is not permitted. Impacts would be the same as those identified in *Effects Common to All Alternatives*.

Effects under Alternative B

Alternative B would designate approximately 430,800 acres within HMAs as avoidance areas for wind energy turbines or transmission lines and 65,300 acres

within HMAs as variance areas for solar. These provisions would protect wild horses and burros in the designated areas more than current management.

Effects under Alternative C

Renewable energy impacts on wild horses and burros would be reduced most under Alternative C due to the designation of approximately 615,700 acres within HMAs as wind energy exclusion areas. Approximately 47,000 acres would be variance areas for utility-scale solar, preserving more acreage from large-scale solar projects than current management.

Effects under Alternative D

Alternative D would designate approximately 430,800 acres as avoidance areas for wind energy turbines or transmission lines and 50,200 acres as variance areas for solar. These provisions would protect wild horses and burros in the designated areas more than current management.

Effects under Alternative E

Alternative E would designate approximately 420,400 acres as avoidance areas for wind energy turbines or transmission lines and 53,900 acres as variance areas for solar. These provisions would protect wild horses and burros in the designated areas more than current management.

Wild Horse and Burros: Effects from Areas of Critical Environmental Concern

Effects under Alternative A

Under current management, no ACECs overlap with HMAs, therefore no additional protections to wild horses and burros or their rangeland habitat would occur.

Effects under Alternative B

Under Alternative B, the Namazii Wunu and the Tagim aša Cultural ACECs fall within 66,625 acres of the Pine Nut Mountains HMA. The Black Mountain/Pistone Archaeological District would also fall within 1,310 acres of the Wassuk HMA. These two HMAs would receive additional protections identified in *Effects Common to All Alternatives* above.

Effects under Alternative C

Alternative C would provide the greatest potential for providing additional protections to wild horses and burros and their range as identified in *Effects Common to All Alternatives*. **Table 4-4**, Acres of ACECs that Would Overlap HMAs under Alternative C, identifies the Acres of ACECs that would overlap HMAs under Alternative C.

Table 4-4
Acres of ACECs that Would Overlap HMAs under Alternative C

HMA	ACEC	Acres
Augusta Mountains	Clan Alpine Greater Sage-Grouse	23
Clan Alpine	Clan Alpine Greater Sage-Grouse	58,716
Desatoya	Desatoya Greater Sage-Grouse	9,048
Flanigan	Virginia Mountains Greater Sage-Grouse	12,093
Fort Sage	Virginia Mountains Greater Sage-Grouse	1,597
New Pass-Ravenwood	Desatoya Greater Sage-Grouse	3,730
Pine Nut Mountains	-Namazii Wunu Cultural	123,622
	-Pine Nut Bi-State Greater Sage-Grouse	
	-Pine Nut Mountains Williams Combleaf Botanical	
	-Tagim aša Cultural	

Source: BLM GIS 2014a, BLM GIS 2014b

Effects under Alternative D

Under Alternative D, the Pine Nut Mountains Williams Combleaf Botanical ACEC and the Tagim aša Cultural ACEC fall within 9,135 acres of the Pine Nut Mountains HMA. The Black Mountain/Pistone Archaeological District would also fall within 998 acres of the Wassuk HMA. These two HMAs would receive additional protections identified in *Effects Common to All Alternatives* above.

Effects under Alternative E

Under Alternative E, no ACECs overlap with HMAs, therefore impacts would be the same as under Alternative A (no additional protections for wild horses and burros or their rangeland habitat would be implemented).

Wild Horse and Burros: Effects from Back Country Byways

Effects Common to All Alternatives

Wild horses and burros may be displaced by development of Back Country Byways in their immediate environments. These adverse impacts would be localized, and the public educational benefit of increased wild horse and burro awareness might indirectly benefit wild horses and burros.

Effects under Alternative A

Under Alternative A, 17.4 miles of the Fort Churchill to Wellington Back Country Byway fall within the Pine Nut Mountains HMA under Alternative A. Impacts would be the same as identified under *Effects Common to All Alternatives*.

Effects under Alternative B

Under Alternative B, 17.8 miles of the Marietta Back Country Byway fall within the Marietta HMA; 26.2 miles of the New Pass to Hawthorne Back Country Byway fall within the Pilot Mountain HMA; and 17.4 miles of the Fort Churchill to Wellington Back Country Byway fall within the Pine Nut Mountains HMA. Impacts would be the same as identified under *Effects Common to All Alternatives*.

Effects under Alternative C

Under Alternative C, 17.8 miles of the Marietta Back Country Byway fall within the Marietta HMA. Impacts would be the same as identified under *Effects Common to All Alternatives*.

Effects under Alternative D

No Back Country Byways fall within any HMAs under Alternative D and there would be no impacts on wild horses and burros.

Effects under Alternative E

Under Alternative E, 17.8 miles of the Marietta Back Country Byway fall within the Marietta HMA; 26.2 miles of the New Pass to Hawthorne Back Country Byway fall within the Pilot Mountain HMA; and 17.4 miles of the Fort Churchill to Wellington Back Country Byway fall within the Pine Nut Mountains HMA. Impacts would be the same as identified under *Effects Common to All Alternatives*.

Wild Horse and Burros: Effects from National Trails

Effects Common to All Alternatives

Management actions for preserving national historic trails would provide wild horses and burros protection through rangeland preservation by restricting surface-disturbing and other disruptive activities within the protected zone of the trail.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Wild Horse and Burros: Effects from Wilderness Study Areas

Effects Common to All Alternatives

Management of WSAs would impact wild horses and burros when they overlap with HMAs. In general, the protections afforded to these areas, such as restrictions on surface-disturbing and other disruptive activities, would reduce potential harassment of wild horses and burros and help maintain and improve vegetation conditions, thereby maintaining or improving the rangeland health

and ensuring a thriving natural ecological balance. Limiting motorized vehicles and providing fewer travel ways would reduce disturbance to wild horses and burros and the range that supports them. **Table 4-5**, Acres of WSAs within HMAs, identifies the Acres of WSAs that would overlap HMAs under all alternatives.

Table 4-5
Acres of WSAs within HMAs

HMA	WSA	Acres
Augusta Mountains	Augusta Mountains	46,300
Clan Alpine	Clan Alpine Mountains	165,700
Desatoya	Desatoya Mountains	18,700
North Stillwater	Stillwater Range	8,800
Pilot Mountain	Gabbs Valley Range	71,600
South Stillwater	Job Peak	9,700

Source: BLM GIS 2014a, BLM GIS 2014b

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Wild Horse and Burros: Effects from Back Country Wildlife Conservation Areas

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

No BCWCAs would fall within any HMAs under Alternative A; therefore there would be no impacts on wild horses and burros.

Effects under Alternative B

No BCWCAs would fall within any HMAs under Alternative B; therefore there would be no impacts on wild horses and burros.

Effects under Alternative C

Under Alternative C, 309,000 acres would be preserved as Back Country Wildlife Concentration Areas within HMAs, with plans to safeguard fish and wildlife habitat, allow only dispersed non-motorized recreation opportunities, and maintain the surface values of back country areas. This management program would impact wild horses and burros found in these conservation areas by preserving rangeland quality and limiting disturbance. **Table 4-6**, Acres of Back Country Wildlife Conservation Areas within HMAs, identifies the acres of BCWCAs that would overlap HMAs under all alternatives.

Table 4-6
Acres of Back Country Wildlife Conservation Areas within HMAs

HMA	Back Country Wildlife Conservation Areas	Acres
Clan Alpine	Clan Alpine	59,802
Garfield Flat	Excelsiors	82,248
Marietta	Excelsiors	4,982
Pilot Mountain	-Gabbs Valley Range North	161,971
	-Gabbs Valley Range South	
	-Pilot Mountains	

Source: BLM GIS 2014a, BLM GIS 2014b

Effects under Alternative D

No BCWCAs would fall within any HMAs under Alternative D; therefore there would be no impacts on wild horses and burros.

Effects under Alternative E

No BCWCAs would fall within any HMAs under Alternative E; therefore there would be no impacts on wild horses and burros.

Wild Horse and Burros: Effects from Public Health and Safety*Effects Common to All Alternatives*

Actions to clean up contaminated sites could temporarily impact wild horses and burros by fencing off part of an HMA during cleanup and restoration of that site. Actions to correct and clean up hazards and to protect closed sites would also protect wild horses and burros from possible injury or contamination and would improve the vegetative conditions in the long term within those sites.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Wild Horse and Burros: Effects from Interpretation and Environmental Education

Effects Common to All Alternatives

Development of educational and interpretive opportunities to foster environmental literacy, stewardship, and awareness of BLM management strategies could benefit wild horses and burros by increasing awareness of wild horses and burros and reduces disturbance to animals and damage to the rangeland, forage and water sources.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Wild Horse and Burros: Cumulative Effects

Cumulative impacts on wild horses and burros are similar to those described under *Nature and Types of Effects*, above. Wild horses and burros would directly benefit from actions to increase forage opportunities, to improve range conditions, to maintain or improve water sources, and to eliminate barriers to movement.

Incremental cumulative impacts on wild horses and burros under all alternatives should gradually decrease based on completing carrying capacity analyses that would allow the BLM to adjust AML's based on current land health and water sources along with maintaining AML, achieving standards for rangeland health and/or reducing livestock grazing. Other management strategies and permit requirements, including implementation of mitigation measures and permit stipulations applicable to minerals, lands and realty, and renewable energy development to reduce impacts on vegetation and reclaim disturbed areas would maintain and/or restore thriving ecological conditions within HMAs.

Incremental impacts would vary based on the size and location of disturbance that occurs within HMAs. Management of OHV travel would reduce impacts on wild horses and burros based on the number of acres of open, limited, or closed to OHV use. OHV travel management and use restrictions in PPMAs and PGMAs, other sensitive species management, and ACEC management would protect wild horses and burros by limiting uses in areas where HMAs overlap these areas. Coordination with the state and counties would reduce impacts on wild horses and burros that roam along the WUI and in and out of private lands. Continued removal of excess wild horses and burros above AML would maintain a thriving natural ecological balance within HMAs. Based on the Wild and Free-Roaming Horse and Burro Act of 1971, BLM policy and proposed management actions, a thriving natural balance would continue to exist as cumulative effects of multiple uses within HMAs would not cause unacceptable impacts or deterioration of rangeland. Overall incremental impacts would range from low to moderate and would be dependent on the location and size of disturbance within HMAs, the types of uses and the degree of use restrictions associated with HMAs and managing herds to AML.

4.3.8 Wildland Fire Ecology and Management

The impact analysis affecting Wildland Fire and Ecology management takes into consideration direct, indirect, and cumulative effects of proposed objectives and management actions by resource or uses as proposed under each alternative. The impact analysis includes impacts that may be both beneficial and adverse. Management for the following resources would not result in an effect on wildland fire ecology and management: ACECs, Back Country Byways, WSRs, BCWCAs, and public safety.

Summary

This section describes the direct, indirect, and cumulative impacts associated with fire management including fire suppression, fuels management, and post-fire ESR.

Methods of Analysis

Assumptions

The following assumptions were used to assess the impacts applicable to wildland fire ecology and management. These assumptions are included for the purpose of the analysis and do not represent existing or potential BLM RMP decisions.

- Historical trends indicate that the number or intensity of wildfires will gradually increase over time based on climate.
- Suppression priorities to protect human life and property will increase due to expansion of WUI areas.
- Increased use of BLM-administered lands will increase the potential for human-caused fires.

- BLM-administered lands managed as open to unrestricted OHV travel will result in a higher potential for human-caused fires. Lands containing motocross tracks and facilities will also result in a higher potential for human caused wildfire.
- Implementing fuel treatments will likely reduce fire intensity and the potential for fire spread and will protect resource values and provide public safety.
- ESR treatment priorities are to provide for human life and safety, soil/water stabilization, restoration of important habitat for special status species and would deter establishment of invasive plants.
- Areas dominated by annual invasive plants will continue to increase as a result of wildfire and/or surface disturbance.
- Treatments to improve vegetation health or re-establish vegetation will deter establishment and spread of invasive plants.
- Land tenure adjustments to dispose BLM-administered lands to private ownership will potentially increase the size of WUI areas and increase the need for fire suppression and fuel treatments to protect WUI areas.
- Acquisition of private lands to BLM-administration will increase BLM fire suppression, fuels, and ESR priorities.
- Managing VRM Classes I or II will affect the location, number, and type of fuel treatments in order to maintain the visual integrity view sheds.

Nature and Type of Effects

The nature and type of effects vary by resource and alternative as described in the following sections.

Wildland Fire Ecology and Management: Effects from Air Quality Management

Effects Common to All Alternatives

Compliance with federal, state, local laws, regulations, and standards would restrict the number, timing and location of prescribed fire projects due to federal, state, or local smoke emission restrictions.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Wildland Fire Ecology and Management: Effects from Climate Management

Effects Common to All Alternatives

Utilizing adaptive management to prioritize treatments addressing potential climate change threats includes addressing threats from wildland fire and new invasions of exotic plants. Demands to develop fuel breaks, green strips, and rehabilitation seeding projects would increase. Suppression and fuel treatments would be prioritized in areas containing special status species and areas with important ecosystem functions in order to address wildfire threats caused by climate change.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Wildland Fire Ecology and Management: Effects from Soil Resources

Effects Common to All Alternatives

Implementation of erosion control treatments to protect soils may increase the number and types of ESR treatments necessary to reduce water and wind erosion of soils following a wildland fire. Impacts would depend on the nature and degree of erosion control required.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Wildland Fire Ecology and Management: Effects from Water Resources

Effects Common to All Alternatives

Implementing actions to protect surface water quality and quantity could restrict efficiency of fire suppression operations. Restrictions on retardant use or use of heavy equipment to construct fire lines in and around water sources could allow an increase fire size and/or increase the time to control fires.

Effects under Alternative A

Impacts would be similar to effects common to all.

Effects under Alternative B

Developing water sources on BLM-administered lands for fire suppression activities would improve availability and the strategic location of water sources necessary for fire suppression. Suppression operations would be more efficient and effective.

Effects under Alternative C

Developing water sources concentrating on wildlife use would reduce water development priorities in other areas. Suppression operations protecting other values at risk besides important wildlife areas may be less efficient if water sources are not available.

Effects under Alternative D

Impacts would be similar to those described under Alternative B.

Effects under Alternative E

Impacts would be similar to those described under Alternative B.

Wildland Fire Ecology and Management: Effects from Vegetation Resources (Forest and Woodlands)

Effects Common to All Alternatives

Managing and monitoring forest health would identify areas with high fuel loadings and serve to identify fuel treatments to reduce fire hazards. Management efforts to reduce fuel loadings would ensure forest health is maintained or improved. Fuel treatments would reduce fire intensity and/or size.

Effects under Alternative A

The impacts and effects of current management would be similar to those effects described under *Effects Common to All Alternatives*.

Effects under Alternative B

Alternative B would convert as many as 20,000 low-density pinyon-juniper areas to sagebrush dominated communities per year until 200,000 acres of sagebrush has been restored. In addition 8,500 acres of low-density pinyon-juniper would be removed and 6,500 acres of medium density pinyon juniper woodlands would be treated per year. This alternative affords the greatest number of woodland treatments and treatment acres compared to other alternatives. Fuel treatments (fuel breaks, green strips, thinning) would lower the potential for fire ignition, spread, and intensity. Alternative B would allow the full suite of fuel treatment methods including; prescribed fire in areas with riparian stands. Wild fires would be less intense and not spread as quickly in areas treated. Allowing salvage of fire-killed trees would reduce fuel loads and potential for fire ignition and spread. Insect killed stands would not be salvaged making those areas vulnerable to fire. Allowing extraction of wood products commercially and for biomass would further reduce fuel loads reducing the potential for high fire intensity and spread.

Effects under Alternative C

Alternative C would remove 3,500 acres of low-density pinyon pine and thin 1,500 acres of medium- to high-density pinyon pine annually. Lower fuel loadings would occur to a lesser extent than Alternative B. Fuel breaks would also reduce the potential for ignition, fire spread, and intensity but at lower levels compared to Alternative B. No commercial harvesting and biomass harvesting of wood products would be allowed leaving fewer areas where fuels have been thinned or removed. The potential for higher fire intensity and spread would be greater compared to Alternative B. Management of riparian stands would be similar to Alternative B except mechanical treatments or mastication would not occur. Fuel treatments may not be as effective in areas where mastication would be the most effective treatment means to reduce fuels. Allowing salvage of fire-killed trees and from insects and disease would reduce fuel loads near roads and campgrounds. Areas not near roads or campgrounds would result in higher potential for increased fire intensity and spread.

Effects under Alternative D

Management of fuels under Alternative D would focus on scenic, recreation, and wildlife habitat values and around communities. Managing fuels for wildlife habitat and around communities would increase demands for fuel treatments. Focusing management based on scenic values would limit the placement of fuel breaks in areas having high scenic values as some fuel break locations or treatment methods may not be desirable. Under this alternative treatments would be less effective. Implementing mitigation measures when conducting fuel treatments would help ensure adverse impacts from fuel treatments are

reduced. Fuel treatments within riparian stands would be limited to protect biological diversity, water yield, native plant and tree health and provide wildlife habitat. Fewer treatment methods would be available and would be limited hand thinning. Fuel treatments would be smaller and less effective making riparian stands more vulnerable to wildfire. Alternative D would allow salvage to meet local wood product demand and protect public safety. Fuel loads and vulnerability to fire would be higher in areas where public demand for wood products is low.

Effects under Alternative E

Under Alternative E 8,500 acres of low-density pinyon-juniper areas would be removed and 6,500 acres of medium- and high-density pinyon juniper lands would be thinned annually. Fire suppression would benefit from lower fuel loadings and construction of fuel breaks. Fire intensity and spread would be reduced. Allowing extraction of wood products for personal use would further reduce fuel loads and the potential for high fire intensity and spread.

Wildland Fire Ecology and Management: Effects from Vegetation Resources (Restoration and Rehabilitation)

Effects Common to All Alternatives

Successful fire rehabilitation projects would stabilize and rehabilitate areas that have burned. The BLM may, as appropriate, conduct ESR treatments in accordance with the ESR Handbook #1742-1. Objective priorities include: human health and safety; soil and water stabilization; designated critical habitat for federal/state, listed, proposed or candidate species; critical heritage resources; invasive plants; and monitoring. Areas would be stabilized and rehabilitated in the long term.

Effects under Alternative A

Effects under Alternative A would be similar to *Effects Common to All Alternatives*.

Effects under Alternative B

Under Alternative B, ESR efforts would include the use of native or non-native plant species with the focus on reducing the establishment of cheatgrass and other invasive species. Establishment of seeded species would most likely occur and be successful in the short term as seed from more plant species; both native and non-natives would be available. Long-term rehabilitation objectives to re-establish wildlife habitat or diverse vegetation communities may not be achieved as the short-term objectives would focus on deterring invasive plant species.

Effects under Alternative C

Under Alternative C, ESR treatments would focus on rehabilitation of high valued wildlife habitat. ESR re-vegetation success would be dependent on achieving wildlife habitat objectives. Overall short-term success would be lower compared to Alternative B as wildlife habitat rehabilitation requires a longer period of time to establish a diverse vegetation community providing necessary

wildlife cover and food. A diverse native seed mix specifically for wildlife habitat would be included in the re-seeding efforts and availability of suitable native seed could be limited.

Effects under Alternative D

Alternative D would focus on rehabilitation of urban interface areas using fire resistant species. Use of native seed would be emphasized however; non-native seed would be used subject to where probability of success or availability of native seed is low. ESR short-term success would be lower compared to Alternative B as only fire resistive plant species would be seeded along with an emphasis on use of native species. Long-term objectives would take a greater period of time to achieve and may not address objectives related to rehabilitation of wildlife habitat.

Effects under Alternative E

Effects would be similar to Alternative D except that WUI and improving high value habitat objectives would be considered. Revegetation would include use of native and non-native species relative to the site potential increasing the likelihood of achieving seeding success. Short-term and long-term objectives are more likely to be achieved over time under this alternative.

Wildland Fire Ecology and Management: Effects from Vegetation Resources (Invasive, Nonnative Species, and Noxious Weeds)

Effects Common to All Alternatives

Implementing standard operating procedures and mitigation measures to wash the undercarriages of fire suppression equipment would limit the potential for spread of invasive, nonnative and noxious weeds during suppression operations. Implementing integrated weed control strategies would limit the spread of invasive, nonnative species, and noxious plants and would serve to improve the potential for ESR treatment success.

Effects under Alternative A

Effects would be similar to those described under common to all.

Effects under Alternative B

Alternative B provides for the use of appropriate control methods including; mechanical, biological, and chemical treatments to control invasive, nonnative species and noxious plants. Allowing the full spectrum of control methods would improve the potential for ESR treatment success.

Effects under Alternative C

Alternative C restricts the use of chemical control treatments. Control of invasive, nonnative and noxious plants within ESR treated areas would be more difficult and inefficient depending on site-specific conditions. The potential for ESR success would be lower compared to Alternative B.

Effects under Alternative D

Impacts would be the same as those described under Alternative B.

Effects under Alternative E

Impacts would be the same as those described under Alternative B.

Wildland Fire Ecology and Management: Effects from Fish and Wildlife Management

Effects Common to All Alternatives

Applying disturbance buffers and seasonal restrictions to protect raptor and migratory nests and aquatic habitats, may limit location and timing of fuels and ESR treatments.

Effects under Alternative A

Impacts would be similar to those described under common to all.

Effects under Alternative B

Alternative B would limit the use of prescribed fire within PPMA to habitats having an annual precipitation above 12 inches and areas not vulnerable to establishment of invasive annual plants. Implementation of appropriate fuel treatments within PPMA areas would require other treatment methods without prescribed fire. Fuel treatments may be less effective in PPMA areas if the preferred treatment is prescribed fire. Alternative B would also prioritize fuel treatments in PPMA habitats that are being invaded by pinyon and/or juniper.

Effects under Alternative C

Alternative C prohibits use of prescribed fire within any PPMA and PGMA. Fuel treatment options would be restricted, thereby increasing the potential for wildland fire ignition and spread in PPMA and PGMA areas, especially if prescribed fire is the most effective fuels treatment option. PPMAs and PGMAAs would also be prioritized for fuel treatments utilizing other treatment methods excluding prescribed fire to create movement corridors, connect habitats, or reduce the potential for catastrophic fire. More treatment objectives would be considered, excluding prescribed fire when planning projects.

Effects under Alternative D

Effects would be the same as Alternative B. However, areas prioritized for fuel treatments would be within sagebrush areas invaded by pinyon or juniper and would include both PPMA and PGMAAs in order to create movement corridors, connect habitats, or reduce the potential for catastrophic fire.

Effects under Alternative E

Impacts from implementing Alternative E would be similar to impacts resulting from Alternative B. However, Alternative E does not provide prescribed fire in PPMAs with less than 12 inches of precipitation. Other fuel treatment methods

would be employed in those areas. Fuel treatments would be prioritized within areas invaded by pinyon or juniper with impacts similar to Alternatives C and D.

Wildland Fire Ecology and Management: Effects from Special Status Species Management

Effects Common to All Alternatives

Effects from special status species management are similar to those described under the wildlife section, which includes special status species management. Designations of ACECs to protect special status plant and wildlife species would increase suppression and fuel treatment priorities to protect these areas from wildfire. Management of special status species ACECs may include restrictions limiting some suppression actions (e.g., use of dozers) in order to protect resource values from suppression damage.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Wildland Fire Ecology and Management: Effects from Wild Horse and Burro Management

Effects Common to All Alternatives

Management of wild horses and burros includes removal or exclusion of wild horses and burros from fire rehabilitated areas. Removal of animals would reduce the potential for grazing and trampling of newly established vegetation and would promote potential for short-term and long-term success of ESR treatments.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Wildland Fire Ecology and Management: Effects from Wildland Fire Ecology and Management

Effects Common to All Alternatives

Fire management is guided by the 1995 Federal Wildland Fire Management Policy and 2001 Fire Policy Update. Utilizing a wildfire decision support system for suppression operations prioritizes suppression response providing resources where they are needed most. Fire management response are also specifically pre-defined as outlined in District fire management plans or other operating plans and are subject to fire management and constraints identified in specific Fire Management Units within the Fire Management Plan. Employing minimum impacts suppression tactics would help reduce impacts on other resources during suppression operations. Suppression operations include assignment of one or more resource advisors as a standard practice to reduce the potential for adversely impacting high value resources. Implementing fire danger restrictions (e.g., campfire restrictions, smoking, and target shooting) would reduce the potential for human-caused fire.

Implementing fuel treatments would reduce fire intensity and spread providing public safety and protecting property and resource values.

ESR treatments would provide stabilization and rehabilitation of burned areas. Planting and seeding areas would reduce the potential for establishment and spread of cheatgrass and other invasive plant species and re-establish wildlife habitat.

Stressing public outreach and education through fire prevention activities would serve to reduce the potential of human-caused fire.

Effects under Alternative A

Effects would be similar to those described under common to all.

Effects under Alternative B

Alternative B affords the full range of fire management to suppress fires. Suppression efforts would be the most efficient providing priority for firefighter and public safety, protection of property, and protection of high value resources. The potential for fire spread would be the lowest under this alternative. Fuel treatments under Alternative B would prioritize treatments to

protect property and infrastructure, resulting in a higher level of protection from wildfire. ESR objectives under Alternative A (See Row #73 on Page 2-42, Vegetation – Restoration and Rehabilitation) would focus on deterring the establishment and spread of invasive species from burned areas. Treatments would be designed to address short-term re-vegetation using seeded species based on seed availability suitable for the site potential and probability of success. The potential for short-term seeding success would be higher based on short-term objectives. The potential for long-term establishment success of diverse, sustainable, and resilient vegetation would be lower.

Effects under Alternative C

ESR priorities would center on treatments in high value wildlife habitat areas. The potential for recovery under this alternative would be slow as native vegetation would take a longer time to establish. Re-establishment of habitat would slowly occur over time.

Effects under Alternative D

Effects would be the same as Alternative B. Fuel treatments would be prioritized to protect fire safe communities. ESR objectives would prioritize WUI areas using fire resistant plant seed. Areas outside of WUI areas would have a lower priority, and the potential for successful rehabilitation of non-WUI areas would be lower. This alternative stresses seeding with native plant seeds; however, nonnative seed would be used if availability of native seed is limited.

Effects under Alternative E

Impacts would be similar to Alternative B. However, fire protection priorities would be dictated by local agency administrators and resource advisors. Alternative E emphasizes fuel treatment priorities to protect fire safe communities, modify vegetative communities, achieve condition class objectives and protect habitat, watersheds, and riparian areas. Fuel treatment priorities would protect both the public and resource values under this alternative. ESR treatment objective priorities include both WUI and high-valued wildlife habitat areas. The potential for successful long-term rehabilitation treatments would be highest depending on site-specific conditions. This alternative stresses seeding with native plant seeds; however nonnative seed would be used if availability of native seed is limited.

Wildland Fire Ecology and Management: Effects from Cultural Resources Management

Effects Common to All Alternatives

Heavy equipment use would be limited in culturally sensitive areas which could reduce suppression efficiency. Suppression tactics include objectives to protect sensitive cultural resources from wildfire including; use of retardant drops, wrapping historic buildings with flame retardant material, installing sprinklers, strategic placement of fire engines, or installing fuelbreaks. Fuel treatments

causing surface disturbance or visual intrusions affecting the physical integrity of Native American sacred sites would be prohibited. These would be more vulnerable to wildfire.

Effects under Alternative A

Similar to those described under *Effects Common to All Alternatives*.

Effects under Alternative B

In order to protect cultural and historic rock art sites, a 0.125-mile buffer would be applied prohibiting surface disturbing activities and visual intrusions to these sites. Fuels and ESR treatments would be limited to areas outside of the buffer. Treatments may not occur if they cause visual intrusions that adversely affect values through the evaluation of eligibility for the NRHP within these areas. Some cultural and historic rock art sites may be more vulnerable to wildfire.

Effects under Alternative C

Impacts would be similar to those described under Alternative B except that a 1.0 mile buffer would be applied to protect cultural and historic rock art sites.

Effects under Alternative D

Impacts would be the same as Alternative B.

Effects under Alternative E

Impacts would be similar to Alternative B except that the buffer implemented would be 0.5 miles or visual horizon whichever is less. Within the Pistone rock art site prescribed fire or the use of retardant chemicals would be prohibited making this site vulnerable to wildfire.

Wildland Fire Ecology and Management: Effects from Paleontological Resources Management

Effects Common to All Alternatives

Management of paleontological resources would result in negligible or no impacts on fire management. Use of heavy equipment in areas containing high paleontological resource values may be limited during site-specific suppression activities.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Wildland Fire Ecology and Management: Effects from Visual Resources Management

Effects Common to All Alternatives

Management of visual resources to meet objectives would limit; the number, size, and location of fuel treatments and ESR treatments.

Effects under Alternative A

Fuels and ESR treatments would be restricted within 564,100 acres of VRM Class I and 38,300 acres of VRM Class II. Resulting impacts include restrictions on treatment methods in order to achieve VRM objectives; these could include reducing the size or changing the location of fuel treatment projects making them less effective to support suppression operations.

Effects under Alternative B

Impacts would be similar to those to Alternative A except VRM class II acres would be increased to 56,800. More areas would be subject to fuel treatment restrictions

Effects under Alternative C

Impacts would be similar to Alternative A except VRM Class I acres would increase to 981,900 and class II would increase to 733,900 acres resulting in larger areas applicable to fuels and ESR treatment restrictions. Fire suppression may not be as effective in areas that limit or restrict fuel treatments.

Effects under Alternative D

Impacts would be similar to Alternative A except VRM Class II acres would be 66,400 acres.

Effects under Alternative E

Impacts would be similar to Alternative A, with the same number of acres managed as VRM Class I, but with more acres (513,600 acres) managed as VRM Class II.

Wildland Fire Ecology and Management: Effects from Caves and Cave Resource Management

Effects Common to All Alternatives

Management of cave resources would cause minimal effects on fire management. Some infrastructure, such as interpretive signage or kiosks may elevate suppression priorities to protect these structures.

Effects under Alternative A

Impacts would be similar to those described under common to all alternatives

Effects under Alternative B

Effects would be similar to Alternative A.

Effects under Alternative C

Alternative C prioritizes fuel treatments to protect significant caves. Fuel treatment priorities would increase and treatment priorities to protect other areas such as WUI and high value resources may be deferred or reprioritized in order to protect significant caves.

Effects under Alternative D

Effects would be similar to Alternative C.

Effects under Alternative E

Effects would be similar to Alternative C.

Wildland Fire Ecology and Management: Effects from Forestry and Woodland Product Management

See **Vegetation: Forest and Woodlands** section for impact analysis.

Wildland Fire Ecology and Management: Effects from Livestock Grazing Management

Effects Common to All Alternatives

Utilizing appropriately managed prescribed grazing treatments would reduce fuels and the potential for fire spread in areas where infrastructure such as fencing is in place. Making burned areas unavailable to livestock grazing would protect re-seeded areas as newly established seedlings would not be grazed or trampled, improving the potential for ESR success. Discontinuing or reduced grazing strategies may increase fuel loadings in the short term. Impacts would vary based on the number of AUMs discontinued or reduced. Grazing restrictions would also reduce the potential for establishment and spread of invasive, nonnative, or noxious plants by livestock.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Wildland Fire Ecology and Management: Effects from Geology and Mineral Management

Effects Common to All Alternatives

Construction of mineral development infrastructure would increase suppression priorities to provide public safety and protect property. Mines transport flammable liquids which would increase the potential for human-caused fire. Mineral development infrastructure includes construction of roads that would improve access for fire suppression equipment. Delineating or designating areas as open, closed, or withdrawn to mineral development or managing these lands with NSO stipulations would reduce mineral-related property infrastructure that would require fire suppression protection. These actions would also reduce public visitation and the potential for human-caused fires. Reclaimed exploration or mining areas would serve as fuel breaks to support suppression operations depending on the location of wildfires.

Effects under Alternative A

Alternative A would close 194,900 acres and proposes to withdraw 3,700 acres to locatable minerals development. Management of fluid minerals would close 839,100 acres, apply NSO stipulations to 700 acres, and no acres would be subject to CSU stipulations. Salable minerals management actions would close 564,200 acres to development, and nonenergy leasable minerals management actions would close 738,800 acres. This alternative affords the fewest acres closed to development and the fewest surface restrictions, resulting in the potential for more mineral operations. Compared to other alternatives, Alternative A minerals management would result in more development infrastructure, requiring more fire-suppression in developed areas.

Effects under Alternative B

Compared to Alternative A, Alternative B would close 194,900 acres to locatable minerals and proposes withdrawal of 439,600 acres. Management of fluid minerals would close 768,500 acres, apply NSO stipulations to 404,600 acres, and 2,120,200 acres would be subject to CSU stipulations. Salable minerals management actions would close 807,200 acres to development, and nonenergy leasable minerals management actions would close 981,900 acres. This alternative reduces the number of acres closed to fluid minerals but increases the number of NSO acres applicable to fluids. A greater number of acres would be managed as closed to nonenergy leasing compared to Alternative A. Alternative B would provide more restrictions to mineral development than Alternative A as more areas would be managed as closed to mineral development. Consequently development of mineral related infrastructure would be lower reducing the fire suppression priorities.

Effects under Alternative C

Alternative C would close 194,900 acres to locatable minerals development and proposes to withdraw 117,500 acres. Management of fluid minerals would close 2,081,700 acres, apply NSO stipulations to development on 1,039,200 acres, and 1,242,800 acres would be subject to CSU stipulations. Salable minerals management actions would close 3,004,800 acres to development, and nonenergy leasable minerals management actions would close 2,960,800. This alternative would close the most acres to mineral development and would manage the most acres with surface restrictions, restricting the potential for mineral development and associated infrastructure. Suppression priorities to protect mining related infrastructure would be the lowest under this alternative.

Effects under Alternative D

Alternative D would close 194,900 acres to locatable minerals development and proposes to withdraw 440,800 acres. Management of fluid minerals would close 737,000 acres, apply NSO stipulations to development on 864,800 acres, and 2,071,400 acres would be subject to CSU stipulations. Salable minerals management actions would close 564,600 acres to development, and nonenergy leasable minerals management actions would close 4,064,500 acres. A greater number of acres will be subject to CSU stipulations, which would provide fewer infrastructure areas requiring fire suppression prioritization, otherwise impacts on fire management would be similar to Alternative A.

Effects under Alternative E

Alternative E would close 194,900 acres and proposes to withdraw 80,800 acres to locatable minerals development. Management of fluid minerals would close 1,007,200 acres, apply NSO stipulations to development on 935,900 acres, and 1,844,900 would be subject to CSU stipulations. Salable minerals management actions would close 1,662,400 acres and nonenergy leasable minerals management actions would close 1,435,700 acres to development. This alternative affords a higher level of infrastructure protection from locatable minerals and a higher level of infrastructure protection from leasable minerals compared to the other alternatives with the exception of Alternative C.

Wildland Fire Ecology and Management: Effects from Recreation and Visitor Services

Effects Common to All Alternatives

Providing for dispersed recreation, extensive recreation management areas (ERMAs), and special recreation management areas (SRMAs) would increase public visitation and the potential for human-caused fire ignition. Management of areas as SRMAs would increase fire suppression priorities to provide public safety and protect recreation values and associated infrastructure. These areas would also require additional fuel treatments to protect areas from wildfire. ESR treatments would be prioritized to restore areas burned within and next to SRMAs.

Effects under Alternative A

Developing the Lemmon Valley Motocross Area would increase the potential for human-caused fire due to increased visitation and motorcycle use. Protecting existing recreation areas and associated infrastructure would elevate fire suppression priorities and demand for fire resources. Alternative A would manage two locations as SRMAs; therefore, suppression priorities would focus on two SRMAs.

Effects under Alternative B

Managing the Lemmon Valley Motocross Area would cause the same impacts as described under Alternative A. Permitting commercial activities, competitive events, and organized groups may increase the potential for human-caused fire. Development of permit stipulations and mitigation measures would help reduce the potential for human-caused fire. Alternative B would manage 6 SRMAs. Suppression priorities would focus on 6 SRMAs. A higher number of fuel treatments would also be required to protect recreation values and infrastructure.

Effects under Alternative C

Eliminating opportunities for Motocross would serve to reduce the potential for human-caused fire ignition in the area. Permitting commercial activities would be similar to Alternative B. Alternative C would manage 3 locations as SRMAs. Suppression priorities would focus on 3 SRMAs. The potential for human-caused fire would be the lowest of any alternative.

Effects under Alternative D

Pursuing Recreation and Public Purposes Act leasing for management and operation of the Lemmon Valley Motocross facility would not create additional impacts on fire resources. The BLM would manage four areas and management would be similar to Alternative B. Pursuing partnerships to manage use and maintenance of the facilities may serve to reduce the potential for human-caused fire based on public education and sharing of resources.

Effects under Alternative E

Management of the Lemmon Valley Motocross facility would generate fire impacts the same as Alternative D.

Wildland Fire Ecology and Management: Effects from Comprehensive Travel and Transportation Management

Effects under Alternative A

Alternative A would manage 3,840,300 acres as open to cross-country travel. The potential for human-caused fire due to OHV travel in open areas would be the highest of the alternatives. Alternative A proposes to manage 6,900 acres as closed to OHV use. The potential for human-caused fire within closed areas would be reduced.

Effects under Alternative B

Alternative B would manage 95,300 acres as open to cross-country OHV travel. The potential for human-caused fire would be lower compared to Alternative A. However, Alternative B proposes to close 4,300 acres to OHV use, which is fewer than Alternative A. The potential for human-caused fire within closed areas would be similar to Alternative A.

Effects under Alternative C

Alternative C would manage 1,300 acres as open to cross-country OHV travel. The potential for human-caused fire would be lowest of the alternatives as this alternative has the lowest number of acres open to cross-country travel. Alternative C would close 598,000 acres to OHV use, the most of any alternative.

Effects under Alternative D

Alternative D would manage 22,700 acres as open to unrestricted motorized vehicle travel and 1,600 acres as closed. The potential for human-caused fire would be lower than Alternative A.

Effects under Alternative E

Alternative E would manage 55,700 acres as open to cross-country travel. The potential for human-caused fire would be similar to Alternative B differing by 24,100 fewer acres. Alternative E would manage 6,200 acres as closed to OHV use. The potential for human-caused fire within closed areas would be similar to Alternative A.

Wildland Fire Ecology and Management: Effects from Lands and Realty

Effects Common to All Alternatives

Granting rights-of-ways would improve access for suppression operations. Installation of infrastructure as a result of granting ROW would increase suppression priorities to provide for public safety and protect property. Land tenure adjustments to dispose BLM-administered lands would potentially increase the size of WUI areas and demands for fire suppression to protect life and property. Disposals would also create more WUI areas requiring more fuel treatments to protect areas. Acquisitions would increase the amount of BLM-administered lands that require fire suppression response and fuel treatments to protect human and resource values. Suppression priorities would be determined based on fire fighter and public safety, property, and resource values at risk.

Effects under Alternative A

Alternative A would dispose 179,700 acres, changing BLM-administered lands into private lands and expanding WUI areas. Demands for fire suppression protection and fuel treatments in WUI areas would be the lowest of the alternatives.

Effects under Alternative B

Alternative B would dispose 273,500 acres, changing BLM-administered lands into private lands and expanding WUI areas. Demands for fire suppression protection and fuel treatments in WUI areas would be higher than under Alternative A.

Effects under Alternative C

No similar action

Effects under Alternative D

Alternative D would dispose 332,500 acres, changing BLM-administered lands into private lands and expanding WUI areas. Demands for fire suppression protection and fuel treatments within WUI areas would be higher compared to Alternatives A.

Effects under Alternative E

Alternative E would dispose 267,200 acres, changing BLM-administered lands into private lands and expanding WUI areas. Demands for fire suppression protection and fuel treatments would be similar to Alternative D.

Wildland Fire Ecology and Management: Effects from Renewable Energy

Effects Common to All Alternatives

Granting ROW authorizations to renewable energy companies would result in similar impacts described under Lands and Realty.

Geothermal plants that transport flammables would increase the potential for human-caused fire.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Wildland Fire Ecology and Management: Effects from Areas of Critical Environmental Concern

Effects Common to All Alternatives

Management of ACECs would cause few if any impacts on fire management and ecology. ACECs may be areas that require a higher suppression priority depending on the values at risk.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Wildland Fire Ecology and Management: Effects from Back Country Byways

Management of Back Country Byways would cause no impacts on fire management and ecology.

Wildland Fire Ecology and Management: Effects from National Trails

Effects Common to All Alternatives

Impacts from management of national historic trails would be similar to those described in the cultural resources section. Fire suppression operations may be restricted in areas near national trails in order to protect trail segments. Restrictions include limiting the use of dozers or other equipment. Protection of national historic trails and their setting may limit the number, size, and location of fuel treatments.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Wildland Fire Ecology and Management: Effects from Wild and Scenic Rivers

Effects Common to All Alternatives

There would be no impacts on fire management resulting from WSR management. Fuel breaks may be required in order to protect WSR outstanding remarkable values (ORVs) near eligible streams or stream segments.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Wildland Fire Ecology and Management: Effects from Wilderness Study Areas

Effects Common to All Alternatives

Subject to BLM WSA policy, fire suppression activities would be restricted within WSAs. Limited access and prohibition of heavy equipment use would make fire suppression more difficult.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

**Wildland Fire Ecology and Management: Effects from Back Country
Wildlife Conservation Areas**

Effects Common to All Alternatives

There would be no impacts on wildfire management and ecology from delineation of BCWCAs.

Wildland Fire Ecology and Management: Effects from Tribal Interests

Effects Common to All Alternatives

Fuelbreak locations and designs would be subject to input received through the Native American Consultation process.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

**Wildland Fire Ecology and Management: Effects from Interpretation and
Environmental Education**

Effects Common to All Alternatives

Implementing public environmental education relating to fire prevention would help support fire management and reduce the potential for human-caused fires.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Wildland Fire Ecology and Management: Cumulative Impacts

Past, present, and Reasonably Foreseeable Future Actions identified are; climate change, invasive, non-native species management, lands and realty (land tenure adjustments and rights-of-ways), livestock grazing, minerals exploration and development, renewable energy development, recreation including travel management, vegetation management, wildlife and special status species management, wild horse and burro management and wild fire and ecology management.

Past and Present Actions

Few past and present management actions relating to climate change have occurred resulting in no impacts on wildland fire ecology and management. Management of invasive, non-native species and noxious weed management centers on integrated weed management approaches and includes working with other federal, state, local agencies and other partners to prioritize and develop treatment control strategies. Control strategies have improved the potential for ESR success following wildfire as controlling noxious plants and weeds has promoted re-vegetation success. Past and present land tenure adjustments have increased the suppression resource demands as some 29,300 acres of previously owned private lands has been acquired. Increasing the BLM-administered land base increases fire suppression and fuel treatment demands. Past and present livestock grazing has had few, if any impacts on fire and ecology management. Past and present minerals development have increased public visitation and developed infrastructure that have increased suppression and fuel treatment priorities in order to protect human life and property. Past and present impacts from renewable energy would be similar to past and present minerals impacts. Recreation management from past and present actions includes managing two recreation areas as special recreation management areas. Fire suppression and fuel treatments would be priorities to protect these areas. Past and present travel management provides the highest number of acres “open” to unrestricted travel. The potential for human-caused fire has been high due to open areas. Past and present vegetation management included treatments to maintain and improve vegetative health, achieve land health standards, and reduce fuel loadings. These strategies would reduce the potential for fire spread reducing the demands for fire resources. Wildlife and special status species management has had minimal impacts on fire resources. There are minimal impacts on fire resources based on wild horse and burro management. Past and present impacts from fire management has gradually increased over time due to increasing number of wildfires or increasing size of wildfire. Many of these have

threatened WUI areas. Increasing demands to suppression, install fuelbreaks and stabilize areas that have burned have occurred over time.

Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions to address threats due to longer fire seasons would increase the number of fuel treatments necessary to protect human life and values at risk. Future impacts from invasive, non-native species and noxious weed management would be similar to those identified under past and present actions. As the number of fire increase along with potentially larger fires, weed management demands would increase stretching ESR priorities. Reasonably foreseeable future actions would anticipate continued acquisition of private lands especially inholdings within designated areas such as WSAs and ACECs. The potential for land disposal would increase due to public private land interface areas. More BLM-administered lands could be converted to private lands in those areas. However, increasing the private land base may also increase the size of WUI areas requiring additional suppression resources and fuel treatments to protect the public. Reasonably foreseeable future actions relating from livestock grazing would be similar to past and present actions. Based on projected growth of mineral projects, development would continue to increase fire management priorities. Anticipated growth in renewable energy would increase public visitation and infrastructure increasing fire suppression and fuel treatment demands. Increasing the number of SRMAs would further increase suppression and fuel treatment priorities. Reasonably foreseeable future actions include more travel management restrictions reducing the potential for human-caused fire. Impacts from vegetation management would be similar to those described under past and present actions. Managing for special status species and priority wildlife areas would increase fire priorities to suppress fire and develop fuel treatments to protect these areas. There would be minimal impacts from wild horse and burro management. It is anticipated that fire management demands would continue to increase but at a higher rate due to increased population growth and changes in climate.

Incremental Cumulative Impact – Combined Past, Present, Reasonably Foreseeable Actions – All Alternatives

Incremental impacts would be similar between all alternatives based on climate change. Impacts would be variable based on drought conditions. Longer drought conditions would increase the number, intensity and spread of wildfire. Impacts from invasive, non-native and noxious weed management would improve re-vegetation success in treated areas however more areas may not receive treatment depending on climate conditions and the number of fire acres burned. Incremental impacts on fire management from realty would increase fire suppression and fuel treatment demands requiring more suppression resources and budgets. There would be no incremental impacts from livestock grazing to fire management. Incremental impacts from minerals would stretch fire suppression and fuel treatment resources making lower priority areas more vulnerable to fire spread. Renewable energy would create increases in fire

suppression demands and treatments. Incremental impacts would from recreation management would increase suppression and fuels priorities from 2 to as many as 6 SRMAs. Travel management incremental impacts would lower the potential for human-caused fire. Impacts would be dependent on the number of acres managed as open or closed to travel. Incremental impacts from vegetation management would continue to improve vegetation health and reduce fire potential. Incremental impacts from wildlife and special status species management would increase suppression and fuel treatment demands and priorities to protect these areas. There would be no incremental impacts on fire resources from wild horse and burro management. Fire suppression and fuel treatment demands and priorities would continue resulting in increased cost to suppress fire and provide protection for the public, property, and high value resources.

4.3.9 Cultural Resources

This section discusses effects on cultural resources from proposed management actions of other resources and resource uses. Existing conditions concerning cultural resources are described in **Section 3.2.9, Cultural Resources**.

Cultural resources are contemporarily considered evidence of past and present expressions of human culture and history in the physical environment. The term “cultural resource” can refer to archaeological and architectural sites, structures, or places with important public and scientific uses, and may include locations (e.g., sites, natural features, resource gathering areas or places) of traditional cultural or religious importance to specified social and/or cultural groups. Potential impacts on National Historic Trails are discussed in **Section 4.5.3, National Trails**. Native American religious concerns are addressed in **Section 4.6.1, Tribal Interests**. Finally, caves and cave resources, which may contain cultural resources, are discussed in **Section 4.3.13, Caves and Cave Resources**.

Summary

The planning area contains archaeological evidence of habitation and use for at least the past 13,000 years. Evidence of prehistoric human activity within the boundary of the planning area varies in complexity, type, environmental setting, and location. In addition to the vast depth of time represented by these resources, a wide range of behaviors are also indicated, including hunting, gathering, tool manufacture, trade and exchange, and expression of spirituality. Historic period cultural resource sites contain evidence of the common activities and resource uses that attracted people to the region, such as mining; transportation trails and roads; ranches and ranching-related facilities; and towns within the planning area.

The primary goals of cultural resource management are to identify and evaluate these resources, determine their appropriate management, and to administer them accordingly, both on public lands and on other lands where BLM decisions

could affect cultural resources. The objective of cultural resource management has several parts: preserving sites and landscapes, promoting public outreach and education, encouraging professional and academic research, and facilitating Native American traditional uses and consultation with interested groups.

Overall, objectives and actions associated with other resources that result in closure to surface disturbance activities would result in beneficial impacts (less chance of disturbance) to any cultural resources that might be present. Management for the following resources would not result in an effect on cultural resources: air quality, climate, wild horses and burros, forestry and woodland management, and WSRs.

Methods of Analysis

Methods and Assumptions

Cultural resource baseline information in **Section 3.2.9**, Cultural Resources, was reviewed for current understanding of known resources and to determine the condition of the resources. Also, all laws pertinent to determining effects on cultural resources (e.g., National Historic Preservation Act [NHPA]) were considered and included in criteria for determining impacts. This known information was overlain with the actions found under each alternative in Chapter 2, and conclusions were drawn based on an understanding of how these types of actions may affect known and potentially discoverable resources.

The analysis includes the following assumptions:

- Impacts on cultural resources are assessed by applying the criteria of adverse effect, as defined in 36 CFR Part 800.5a: “An adverse effect is found when an action may alter the characteristics of a historic property that qualify it for inclusion in the NRHP in a manner that would diminish the integrity of the property’s location, design, setting, workmanship, feeling, or association. Adverse effects may include reasonably foreseeable effects caused by the action that may occur later in time, be farther removed in distance, or be cumulative.”
- The BLM will follow 36 CFR 800, Section 106 and the Nevada State Protocol when addressing federal undertakings; therefore, adverse effects (as defined in the NHPA) on cultural resources would be appropriately mitigated.
- The information on cultural resources in the planning area is based on the results of industry and BLM inventory. However, as these data are geographically biased toward past project-oriented undertakings and cannot accurately predict where and how many resources may exist in unsurveyed areas, this analysis does not attempt to quantify affected resources.

- Cultural resource protection and mitigation measures apply to all proposed federal or federally assisted undertakings, and will be applied at project design and implementation phases.
- Cultural resource inventories will continue into the foreseeable future and would result in the continued identification of cultural resources. The cultural resource data acquired through these inventories and evaluations will increase overall knowledge and understanding of the distribution of cultural resources in the region.
- Impacts on known cultural resource sites from authorized uses will be mitigated after appropriate Section 106 and Nevada State Protocol consultation requirements are met. Mitigation can include project redesign, avoidance, or data recovery.
- Degradation of known and undiscovered cultural resources from natural processes (e.g., erosion) will continue regardless of avoidance of human caused impacts.
- Potential impacts on cultural resources and their settings from subsequent undertakings (implementation of the planning decisions or site-specific project proposals) require separate compliance with the NEPA and Section 106, and result in the continued identification, evaluation, and mitigation of cultural resources to the NRHP. Per the Nevada State Protocol and standard BLM operating procedures, effects on cultural resources eligible for listing in the NRHP and potentially eligible cultural resources will be avoided or mitigated. If previously undiscovered resources are identified during an undertaking, work will be suspended while the resource is evaluated and mitigated to avoid any initial or further impact.

Indicators

The use of indicators in NEPA analysis should provide information on determining the extent or degree to which cultural resources may be damaged, their physical integrity is impacted, or the setting of the resource is damaged (36 CFR 800), and whether future opportunities for scientific research, preservation, or public appreciation are foreclosed or otherwise adversely affected by a proposed action. When assessing whether the action would cause significant impact, the following level-of-effect indicators will be carefully considered:

- **Magnitude:** The amount of physical alteration or destruction which can be expected. The resultant loss of archaeological value is measured either in amount or degree of disturbance.
- **Severity:** The irreversibility of an impact. Adverse impacts which result in a totally irreversible and irretrievable loss of archaeological value are of the highest severity.

- **Duration:** The length of time an adverse impact persists. Impacts may have short-term or temporary effects, or conversely, more persistent, long-term effects on archaeological sites.
- **Range:** The spatial distribution, whether widespread or site-specific, of an adverse impact.
- **Frequency:** The number of times an impact can be expected. For example, an adverse impact of variable magnitude and severity may occur only once. An impact such as that resulting from cultivation may be recurring or ongoing.

Nature and Type of Effects

Direct impacts on cultural resources could result from any proposed management action that would involve surface-disturbing activities which may result in damaging, destroying, or displacing artifacts and features, and constructing modern features out of character with a historic setting. Many cultural resources that occur on or just below the ground are susceptible to surface disturbance and erosion damage. Damaging, displacing, or destroying cultural resources could include removing artifacts from their situational context, breaking artifacts, or shifting, obliterating, or excavating features without appropriate scientific recording or religious/sacred assessment. The information loss is relevant to the site function, dates of occupation, subsistence, and past environments; all of these are important to understanding past cultures. Depending on the extent and type of activity, the amount of physical disturbance could be from slight artifact shifts out of context in a small portion of the site to wholesale destruction of an entire site. Should a portion of a site be affected, it is possible that some of the information available from a site could be retrieved and added to the prehistoric record of the region, thereby reducing the severity of the impacts. However, adverse impacts which result in a totally irreversible and irretrievable loss of archaeological value are of the highest severity.

Indirect impacts on cultural resources include changing the character of the property's use or physical features within the property's setting that contribute to its significance (e.g., isolating the property from its setting) and introducing visual, atmospheric, or audible elements that diminish the integrity of the property's features. Construction activities resulting from implementing the planning decisions, such as facilities associated with energy development, could result in placing modern features onto a landscape that did not have them previously, thereby juxtaposing "modern" industrial features onto a historic landscape. Additionally, any action that would result in increased human and worker presence (e.g., more people visiting a recreation area or workers brought in for construction operations) would risk illicit collecting of surface artifacts, resulting in a loss of scientific information and cultural heritage values for the public.

The potential for undiscovered buried cultural resources and/or human remains exists despite previous archaeological surveys and investigations. Surface disturbing activities would directly impact undiscovered cultural resources and human remains by exposing buried material, resulting in inadvertent artifact destruction or loss of scientific context. Indirect impacts could result from the increased human presence, leading to possible illicit collecting of newly exposed materials.

Any actions that would result in reclaiming landscapes to predisturbance conditions would eliminate the indirect viewshed or setting impacts for cultural resources. Reclamation would likely restore the natural landscape setting but may not result in restoring the historic setting. However, the direct impacts on cultural resources or any unanticipated discoveries made would remain as they were, permanently destroyed or damaged by surface-disturbing actions. Potential reclamation impacts on undiscovered buried cultural materials or human remains would be similar to those noted above, namely that activities could expose buried materials, resulting in inadvertent artifact destruction or loss of scientific context. Additionally, the increased presence of site employees could lead to illicit collection of exposed materials.

Effects on cultural resources would primarily result from unmitigated surface disturbance, such as cross-country travel, wildfires, wildfire suppression activities, erosion, unauthorized collection, vandalism, and trampling. Direct and indirect effects on cultural resources result from any surface-disturbing activity or alteration to the integrity of the resource, including setting. Federal actions defined as federal undertakings under Section 106 of the NHPA require the identification, evaluation, and consideration of adverse effects and the appropriate mitigation of those effects. Nearly all implementation actions would be subject to further cultural resource review before site-specific projects are authorized or implemented. If adverse effects are identified, mitigation measures, including avoidance, would have to be considered to minimize or eliminate the effects.

Soil Resource Management

Because many cultural resource sites are situated on or just below the ground surface, they are susceptible to damage and destruction from ground disturbance and erosion. Damage can include modification of site spatial relationships and displacement and damage of artifacts, features, and midden deposits. This can result in the loss of information relevant to the site function, dates of use, past environments, and other important research questions. Measures under all of the alternatives limiting soil erosion and managing ground-disturbing activities would indirectly protect these cultural resources. Reclamation measures may also preserve or restore the setting of cultural resources.

Vegetation Management

Vegetation: Forest and Woodlands

Managing for forest health would improve woodland habitats and would help protect forest from wildland fire. Forested areas containing traditional pine nut gather areas and culturally modified trees would be protected. Implementing forest health treatments by removing low density pinyon-juniper trees could result in surface disturbing activities, thereby potentially damaging or destroying cultural resources. Impacts would vary based on which treatment method is used. These impacts would be mitigated based on requirements to culturally inventory proposed disturbed areas prior to implementation. Based on inventory results, defined mitigation measures would be implemented including avoidance of sensitive areas.

Vegetation: Rangelands

Maintaining and restoring vegetation cover on rangelands would protect cultural resource sites that are situated on or just below the ground surface and are susceptible to damage and destruction from ground disturbance, erosion, and increased wildland fire. Measures to rest land, restrict grazing, fence sensitive areas, and disperse impacts from riparian areas would also protect cultural sites from ground disturbance. Restoring desired native species may include plants used or valued by tribal users and help maintain the historic setting of an area; however, revegetation efforts could damage cultural resources if surface disturbing application methods were used. Encouraging fire rehabilitation use or introducing/restoring nonnative plants can increase the potential for impacts on historic settings by creating different mosaics of vegetation that would not have been found in the past.

Vegetation: Riparian Areas

Improving or restoring riparian and wetland areas may affect the cultural resources and cultural uses that are often associated with these areas. Restrictive buffers around streams and water bodies and closures to prevent actions and projects that would degrade riparian conditions would indirectly protect cultural resources within these areas.

Vegetation: Noxious Weeds

Implementing weed control measures could result in surface disturbing activities, thereby potentially damaging or destroying cultural resources. While conducting the weed control measures may take only a short period of time (e.g., one application every few years), if they resulted in cultural resource damage, those resources would be permanently damaged. However, over a longer time period, treating weeds would indirectly reduce the risk on cultural resources from wildland fire and suppression, would reduce the potential for erosion of archaeological sites, and would help restore the setting of cultural landscapes.

Vegetation: Restoration and Rehabilitation

Rehabilitation projects conducted to stabilize soils, promote plant resiliency, limit expansion or dominance of invasive species, reestablish native species, and implement ESR, could impact and permanently destroy cultural resources through ground-disturbing activities that could displace, damage, or permanently alter a cultural site if the site was not discovered until after disturbance has occurred.

Effects from Fire and Fire Management

Fire can result in direct disturbance or loss of cultural resources through the destruction or modification of structures, features, artifacts, cultural use areas, and culturally modified trees. Organic materials, and the information that can be obtained from their study are especially vulnerable to heat damage, but intense fire can damage stone as well. Fire control and suppression can involve ground-disturbing activities that can also directly impact cultural resources by altering the spatial relationships of archaeological sites. Fire can also result in impacts through erosion and the increased visibility of cultural resources. Fire can remove vegetation and expose previously undiscovered resources, allowing their study and protection; however, sites exposed by fire or flagged for fire avoidance in prescribed burns can be susceptible to unauthorized collection and vandalism. There could also be impacts on cultural resources from ground disturbance associated with fuel treatments and rehabilitation, the effects of chemicals and fire, and the introduction of seeds and pollens, which could affect the accuracy of paleobotanical data on archaeological sites.

The risk of impacts on cultural resources is greatest from unplanned wildland fire since the locations of cultural resources are less likely to be known and avoided during the fire and fire suppression. Restrictions under the Wildland Fire Decision Support System (WFDSS) and minimum impact suppression tactics are designed to avoid or minimize impacts on sensitive cultural resources. Avoiding the use of retardant to protect open water sources could also protect culturally important water features. Fire breaks are planned and placed to avoid and protect known cultural resources. Cultural resources would be considered before any planned fuel reduction and restoration of native vegetation.

Effects from Livestock Grazing

Livestock grazing is associated with ongoing impacts on cultural resources that are located on or just beneath the ground's surface. Improper grazing and trampling reduces vegetative cover and disturbs the soil, which accelerates erosion and weathering, and can directly impact cultural resources by the modification, displacement and loss of artifacts, features, and middens, which results in loss of valuable cultural resource information regarding site function, date of use, subsistence, past environments, and other research questions. Since cultural resources are often associated with permanent and intermittent water sources, and these areas are attractive to livestock, impacts on cultural

resources are most likely to occur in these areas. Animals also seek shade in rock shelters and can damage cultural resource sites that are often present at those locations. Actions under all alternatives that would aim to protect springs and wetland riparian areas from livestock grazing would reduce the risk of direct disturbance and erosion of any cultural resources present. Actions that improve rangeland health could reduce the potential for impacts on cultural resources from direct disturbance, erosion, and wildland fire.

Effects from Mineral Development

Discretionary mineral exploration and development activities are subject to further cultural resource review at each stage of development through the Section 106 process, mining regulations, or permitting stipulations. Nondiscretionary mining notices are not federal undertakings, but 43 CFR Subpart 3809 specifically provides for the protection of cultural properties by prohibiting operators on claims of any size from knowingly disturbing or damaging cultural resources without mitigation. However, mine notices must be reviewed within 15 days, and it may be difficult to determine the presence of resources in areas that have not been inventoried. Potential impacts that would be addressed include ground disturbance, erosion, intrusions to the setting of the resource, and access leading to unauthorized collection or vandalism.

Restricting mineral activities that would affect NRHP-listed or NRHP-eligible cultural sites, or requiring additional mitigations, would maintain protection for these resources as well as resources not yet inventoried. Provisions for concurrent and interim reclamation would reduce the amount of land disturbed at any one time, which reduces the duration of alterations to setting and the potential for impacts due to erosion of cultural sites. Ongoing impacts on cultural resources in the vicinity of existing mines and drilling locations would continue.

Effects of Recreation and Comprehensive Travel and Transportation Management

Open OHV use can impact cultural resources, through direct disturbance of site structure, artifact breakage and displacement, vandalism, soil compaction, altered surface water drainage, erosion, creation of new routes and visual and aural intrusions to setting. Motorized access could also increase the risk of impacts on resources from unauthorized collection or vandalism. Restricting vehicle use to existing routes would reduce the risk of disturbing cultural resources located off travel routes and would reduce some impacts on setting, but impacts from access could still occur. Enforcing travel routes is difficult, and unauthorized user-created trails would continue to occur, potentially impacting cultural resources. Closure of areas to OHV use provides the most protection for cultural resources, if access for cultural purposes can be maintained.

Avoiding duplication of roads that have common destinations can reduce risks of impacts on cultural resources from ground disturbance and access leading to unauthorized collection or vandalism. Road maintenance such as blading can

disturb the physical integrity of cultural resources in road corridors where inventories are incomplete. However, maintenance can also prevent erosion and braiding and other processes that may threaten the integrity of cultural resources on or near roads.

Effects on cultural resources from SRMA and ERMA and their associated motorized and mechanized management decisions are discussed under Recreation and Visitor Services.

Effects from Back Country Byways

Continuing to manage and enhance the byways would continue to improve the visitor experience and would enhance public appreciation and protection of cultural resources. Developing additional Back Country Byways could lead to more public interpretation of cultural resources, but it could also increase the risk of impacts on resources from unauthorized collection or vandalism.

Cultural Resources: Effects from Soil Resources

Effects Common to All Alternatives

Soil protection measures would seek to limit erosion resulting from ground-disturbing activities and actions on steep slopes. Many cultural resources are susceptible to erosion damage, including modifying spatial relationships of artifacts and destroying features and stratified deposits. The information loss is relevant to the site function, dates of occupation, subsistence, and past environments; all of these are important to understanding past cultures. These measures to protect soils could preserve the integrity of cultural deposits and prevent damage from natural processes.

Effects under Alternative A

In general, indirect protection of cultural resources from soil erosion, compaction, and ground disturbing activities or reclamation requirements would be less under Alternative A because current management requires fewer specific actions than the other alternatives do.

Effects under Alternatives B, C, D, and E

Alternatives B through E would apply CSU stipulations for fluid mineral leasing on lands with slopes greater than 15 percent and less than 50 percent, and on lands with on lands with severe wind or water erosion hazard ratings. Additionally, Alternatives B through E would apply NSO stipulations on slopes greater than 50 percent. Due to these land use restrictions, these alternatives would provide more indirect protection for cultural resources from surface disturbing activities and soil erosion than Alternative A. Impacts on cultural resources in the areas could still occur from other resources management and uses.

Cultural Resources: Effects from Water Resources

Effects Common to All Alternatives

Actions to protect watersheds and municipal source waters through surface use restrictions and erosion controls would provide incidental protections from effects due to surface disturbance and erosion. Actions to modify or remove water control structures, develop wells, and modify water features include risks of disturbance of cultural resources through ground-disturbing activities, livestock trampling, changes in access, visibility, and setting of water features and changes to the water features themselves.

Under all alternatives water quality and availability would be maintained or enhanced which could potentially impact cultural resources near these features.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Cultural Resources: Effects from Vegetation Resources

Effects under Alternative A

Current management specifies fewer actions under Alternative A than the other alternatives for vegetation management. This indicates that while potential impacts from weed, riparian area, and rangeland treatments would be less than the other alternatives, the potential for damage of cultural resources from wildland fire and suppression, and associated increased erosion would be greater than the other alternatives. Alternative A would only protect a 5-acre stand of western white pine from destruction. Impacts on cultural resources from implementation of protective measures would be minimal due to the size of the forest stand and requirements to culturally inventory and mitigate impacts.

*Effects under Alternative B*Vegetation: Forest and Woodlands

Alternative B would improve woodland habitats and would help protect forests from wildland fire by implementing the most aggressive strategies to treat low density pinyon-juniper areas. Forested areas containing traditional pine nut gather areas and culturally modified trees would be protected from wildfire through tree removal. Alternative B would convert up to 20,000 acres of low density pinyon-juniper areas to sagebrush dominated communities. Cultural resources could be damaged from removal, ground disturbance, erosion, fire, and changes in setting. Requirements to inventory and mitigate potential impacts on cultural resources would reduce the potential for impacts. Alternative B also allows extraction of woodland products for personal and commercial uses. Areas containing cultural resources would be more vulnerable to illegal collection.

Vegetation: Restoration and Rehabilitation

Under Alternatives B through E, rehabilitation projects would be conducted to stabilize soils, promote plant resiliency, limit expansion or dominance of invasive species, reestablish native species, and implement ESR, which could inadvertently damage unknown cultural resources in the area as described under *Nature and Types of Effects*. Areas where implementation of ESR would occur vary by alternative.

Vegetation: Riparian Areas

Alternative B would avoid or minimize disturbance, loss, or degradation of riparian and wetland areas. This would provide for more management and indirect protection of cultural resources from surface disturbing activities than Alternative A.

*Effects under Alternative C*Vegetation: Forest and Woodlands

Alternative C would remove low density pinyon-juniper on 3,500 acres. Fewer tree stands would be protected and cultural resources outside of proposed treatment areas would remain vulnerable to wildfire. Alternative C allows only personal use for harvesting of woodland products. The potential for damage to cultural resources and culturally modified trees through woodland harvest would be lower than current management as no commercial harvesting would be allowed. Overall the potential for direct impacts on cultural resources from implementation of forest treatments and harvesting would be lower compared to Alternative A.

Vegetation: Restoration and Rehabilitation

Effects on cultural resources from Vegetation: Restoration and Rehabilitation under Alternative C would be the same as those described under Alternative B except only native plant would be used for restoration work. Use of native seed

mixes would maintain vegetation communities that provide the context for cultural resources found in the area.

Vegetation: Riparian Areas

Riparian management would preclude surface disturbing activities within 100-year floodplains, within 200 feet of riparian areas, and within 500 feet of springs. In addition, riparian and wetland areas would be managed as closed to mineral material disposal with a 200-foot buffer. NSO stipulations would be applied to fluid mineral leasing within 500 feet of riparian and wetland areas, 100-year floodplains, and within 500 feet of playas. The land within 200 feet of riparian and wetland areas would be managed as ROW exclusion areas. Adjustments may be made to these buffers based upon the resource values associated with riparian/wetland areas and the scope of surface disturbing activities. These additional land use restrictions would indirectly protect any cultural resources within these areas from surface disturbing activities. Alternative C would manage riparian areas with the most land use restrictions.

Effects under Alternative D

Vegetation: Forest and Woodlands

Alternative D would engage interested parties to develop restoration and woodland harvesting strategies of pinyon-juniper woodlands. Impacts on cultural resources would depend on the type of treatment strategies implemented and the number of acres treated.

Vegetation: Restoration and Rehabilitation

Effects on cultural resources from Vegetation: Restoration and Rehabilitation under Alternative D would be the same as those described under Alternative B.

Vegetation: Riparian Areas

Alternative D would prohibit surface disturbing activities within 200 feet of riparian areas and within 500 feet of springs. The BLM would manage these areas as ROW avoidance. In addition, riparian and wetland areas would be managed with CSU stipulations for fluid mineral leasing within 200 feet of riparian and wetland areas, 100-year floodplains, and within 500 feet of playas. Adjustments may be made to these buffers based upon the resource values associated with riparian/wetland areas and the scope of surface disturbing activities. These additional land use restrictions would indirectly protect any cultural resources within these areas. Alternative D would provide for more restrictions than Alternative A.

Effects under Alternative E

Vegetation: Restoration and Rehabilitation

Alternative E would remove trees within 8,500 acres low density pinyon-juniper areas. Direct impacts to cultural resources would be greater than Alternative A. The type of impacts would be similar to those as described in effects common

to all and include damage from removal, ground disturbance, erosion, fire, and changes in setting. Requirements to inventory and mitigate potential impacts on cultural resources would reduce the potential for impacts.

Vegetation: Riparian Areas

Alternative E would prohibit surface disturbing activities within 200 feet of riparian areas and within 500 feet of springs. The BLM would manage these areas as ROW avoidance. In addition, riparian and wetland areas would be managed with NSO stipulations for fluid mineral leasing within 500 feet of riparian and wetland areas, 100 year floodplains, and within 500 feet of playas. Adjustments may be made to these buffers based upon the resource values associated with riparian/wetland areas and the scope of surface disturbing activities. These additional land use restrictions would inadvertently protect any cultural resources within these areas. Alternative E would provide for more restrictions than Alternative A.

Cultural Resources: Effects from Fish and Wildlife Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Management of fish and wildlife under Alternative A would not provide for any additional land use restrictions that would reduce the possibility of impacts on cultural resources. Current restrictions and protections for habitat and species that indirectly protect cultural resources would continue, but there would be fewer specific measures and objectives than the other alternatives.

Effects under Alternative B

Wildlife Habitat

Alternative B includes implementing CSU stipulations for fluid mineral leasing within 500 feet of lentic and lotic habitats and 100-foot buffers around fish and wildlife priority habitat. These surface use restrictions, especially around lentic and lotic habitats, would protect any potential archaeological sites in these areas.

Bat Habitat

Bat habitat may also contain archaeological features which could be impacted or protected by bat habitat management. Other than closing access to caves in the event of a white-nose syndrome outbreak or other transmittable disease, Alternative B would not implement management actions to prevent disturbance of bat habitat. Previous access to the caves could result in damage to archaeological resources or their settings.

Effects under Alternative C

Wildlife Habitat

Under Alternative C, wildlife habitat management would implement NSO stipulations for fluid mineral leasing within 500 feet of lentic and lotic habitats. Additionally, Alternative C would manage fish and wildlife habitat as ROW exclusion areas with a 500-foot buffer and would close these areas to mineral material disposal and nonenergy mineral leasing. These restrictions to surface disturbance within these areas are greater than those under Alternative A and would provide the most indirect protection of any potential archaeological sites within these areas.

Bat Habitat

Alternative C would prohibit large-scale surface-disturbing discretionary actions within 500 feet of bat occupied caves. This would reduce the possibility of impacts on surface cultural features that may be around and in these caves more than Alternative A.

Effects under Alternative D

Wildlife Habitat

Under Alternative D, wildlife habitat management would be the same as described under Alternative B.

Bat Habitat

Alternative D would prohibit large-scale surface-disturbing discretionary actions within 200 feet of bat occupied caves. This would reduce the possibility of damage or destruction of surface cultural features that may be in and around the caves. This buffer of surface use restriction is stricter than Alternative, which would not implement a buffer.

Effects under Alternative E

Wildlife Habitat

Wildlife habitat management under Alternative E would apply NSO stipulations within 500 feet of lentic and lotic habitat, and would manage fish and wildlife priority habitat in ROW avoidance areas with a 100-foot buffer. Alternative E would better protect cultural resources than Alternative A.

Bat Habitat

Alternative E would prohibit large-scale surface-disturbing discretionary actions within 0.5 mile of bat occupied caves and within 0.25 mile of caves not known to be occupied by bats. This would protect the greatest amount of caves with the greatest distance of buffer of surface use restrictions. This would indirectly protect the greatest amount of potential archaeological sites that are associated with caves and cave resources.

Cultural Resources: Effects from Special Status Species Management*Effects Common to All Alternatives*

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A provides management of one ACEC to protect sensitive plants. Cultural resources located within this ACEC would also be protected from impacts related to disturbance based on applicable use restrictions.

Effects under Alternative B

Greater Sage-Grouse habitat management would manage PPMA (275,600 acres) with CSU stipulations for fluid mineral leasing and as ROW avoidance areas. These additional surface use restrictions could provide indirect protection of cultural resources within PPMA. However, these potential sites could still be impacted by other mineral development and other resource uses. Alternative B proposes three ACECs to protect sensitive plants and one ACEC to protect special status wildlife. Cultural resources located within these ACECs would be protected from impacts related to disturbance as use restrictions would be implemented. More protection of cultural resources would occur compared to alternative A.

Effects under Alternative C

Alternative C would close PPMA and PGMA (414,200 acres) to fluid mineral leasing, nonenergy mineral leasing, and mineral material disposal. In addition, the BLM would manage these areas as ROW exclusion. Alternative C would apply land use restriction on more surface areas with more land use restrictions to protect Greater Sage-Grouse habitat than other alternatives. This would result in the greatest potential for indirect protection of cultural resources within Greater Sage-Grouse habitat.

Alternative C proposes five ACECs to protect sensitive plants and seven ACECs to protect special status wildlife. This alternative would also protect cultural resources located within these ACECs. Alternative C affords the greatest protection for cultural resources based on sensitive species management.

Effects under Alternative D

Under Alternative D, Greater Sage-Grouse habitat management would apply NSO stipulations for fluid mineral leasing within PPMA (275,600 acres) with no exceptions, modifications, or waivers. Alternative D would apply NSO stipulations for fluid mineral leasing within PGMA (138,600 acres) with exceptions, modifications, and waivers as outlined in **Appendix C**, and would manage PPMA and PGMA as ROW avoidance areas (414,200 acres). Alternative D would provide for less surface use restrictions than Alternative C and E, but more than A and B, and would therefore provide more protection of potential cultural resources within PPMA and PGMA than Alternative A. Alternative D

proposes three ACECs to protect sensitive plants. Cultural resources would be protected within these ACECs. Impacts to cultural resources would be lower compared to Alternative A.

Effects under Alternative E

Greater Sage-Grouse habitat management under Alternative E would be similar to those described under Alternative D. In addition to the management actions under Alternative D, Alternative E would close PPMA and PGMA to nonenergy mineral leasing and mineral material disposal. Alternative E would therefore be more protective of potential cultural resources within PPMA and PGMA than Alternative A. Management of the two proposed ACECs to protect sensitive plants would also protect cultural resources located within the proposed ACECs.

Cultural Resources: Effects from Wildland Fire Ecology and Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Effects from fire management under Alternative A would be the same as those described under *Nature and Types of Effects*.

Effects under Alternative B

Under Alternative B, a full range of fire management activities and options would be utilized to protect all identified values at risk, as identified in the regularly updated fire management plan for the district. Implementing fire management activities and options, including suppression, would cause the same effects as those described in *Effects Common to All Alternatives*.

However, Alternatives B through E would implement ESR projects to stabilize soils, re-establish hydrologic function, maintain and enhance biological integrity, promote plant resiliency, limit expansion or dominance of invasive species, and reestablish native species. Many of the possible activities noted in for burned area rehabilitation, however, would likely result in short duration surface disturbing activities and could result in damage to cultural resources. Requirements to survey for cultural resources prior to any rehabilitation work would reduce this potential risk to cultural resources. In the longer term, once areas have been successfully rehabilitated, cultural resources would be less susceptible to erosion effects and less visible with healthy vegetation coverage.

Effects under Alternative C

Under Alternative C, minimum impact suppression would be applied so that emergency fire management methods would be no greater than necessary to meet fire management objectives. Alternative C would allow the use of dozers for fire management only when there is a threat to public safety or property damage, and chemical agents would not be allowed for suppression activities.

These limits to suppression activities could put cultural resources at greater risk of impact from wildland fire, but at less of a risk for impact from fire suppression activities. Overall, Alternative C would protect sensitive cultural resources from catastrophic impacts of wildfire and wildfire suppression activities.

Under Alternative C, hazardous fuels reduction projects would be implemented where negative impacts of wildland fire are greatest on sensitive cultural resources, as well as sensitive biological and other natural resources. This would reduce the overall possibility of impact cultural resources from wildland fire.

Effects under Alternative D

Under Alternative D a full range of fire management activities and options would be utilized to protect all identified values at risk, as identified in the regularly updated fire management plan for the district. Fire suppression activities would reduce the potential impact cultural resources from wildland fires, but may increase their risk of impact from fire suppression tools and equipment, as described under *Nature and Types of Effects*.

Effects under Alternative E

Alternative E would implement a full range of fire management activities and options to protect all values at risk and to sustain healthy ecosystems within acceptable risk levels. This includes protecting WUI, cultural, paleontological, biological, and other natural resources from catastrophic impacts of wildfire and wildfire suppression activities.

Alternative E would implement hazardous fuels reduction projects where impacts of wildland fire are greatest to public health and safety, sensitive biological, cultural, and other natural resources are greatest.

Cultural Resources: Effects from Cultural Resources Management

Effects Common to All Alternatives

Impacts on cultural resources from proposed land use authorizations would be minimized or avoided by complying with laws and executive orders designed to preserve and protect cultural resources. Complying with management measures for authorized actions requires consulting with federally recognized tribes and other interested parties, identifying and evaluating cultural resources, and adhering to procedures for resolving any adverse effects and mitigating impacts. Completion of the Section 106 process is required for all federal undertakings implementing resource management plan decisions. There is a greater risk of impacts resulting from unauthorized activities, natural processes, dispersed activities, and incremental or inadvertent human actions, especially where inventories are incomplete.

Cultural resource management measures would help identify, preserve, protect, and reduce impacts on cultural resources. Ongoing and planned management measures include the following:

- Conducting inventories, managing NRHP-eligible resources for conservation and protection
- Avoiding adverse effects as the preferred mitigation
- Consulting with federally recognized tribes
- Patrolling and monitoring vulnerable cultural resource areas
- Partnering with academic, educational, and tribal groups for research projects
- Thinning, prescribed fire, and other tools would be used to control fuel load, and outbreak of wildland fires.

Effects under Alternative A

Under Alternative A, the BLM would manage the Pah Rah High Basin (Dry Lakes) Petroglyph District ACEC (3,881 acres) to protect cultural resources. This ACEC is discussed in detail in **Section 4.5.1**, Areas of Critical Environmental Concern.

Additionally, BLM would pursue the withdrawal of locatable minerals from the Grimes Point Archaeological District, the Sand Mountain Recreation Area, and the Cold Springs Historical Site. Alternative A would promote visitation and interpretation of cultural resources at Grimes Point Archaeological District, Hidden Cave, the Pony Express Stations at Sand Springs and Cold Springs, the Cold Springs Telegraph and Stage Stations, and the New Pass Overland Stage Station. Increased visitation could foster a respect for cultural resources in these areas, but may also increase the risk for vandalism and theft.

Effects under Alternative B

Cultural and historic rock art sites would be managed with a 0.125-mile buffer in which surface disturbing activities and visual intrusions that adversely affect these features would be prohibited. Rock sites would be outfitted with interpretive signing, fencing, barriers, and other activities for management of visitor use. The buffer of disturbance prohibition under Alternative B is greater than Alternative A.

The BLM would manage NRHP-listed Properties and Districts, National Historical Landmarks, and Traditional Cultural Properties that are currently listed, eligible, or known but not yet formally designated for the NRHP as ROW-avoidance areas and would apply CSU stipulations for fluid mineral leasing.

Alternative B would designate 8 additional ACECs to protect cultural resources. These ACECs are discussed in detail in **Section 4.5.1**, Areas of Critical Environmental Concern.

All of the alternatives would implement the Native American Graves Protection and Repatriation Act. Alternative B would close areas known to contain human

burials to surface disturbing activities when feasible, and appropriate federal, state, and/or local laws would be followed when disturbance is necessary. The preferred management option of known or discovered human remains under Alternative B would be avoidance.

Effects under Alternative C

Cultural and historic rock art sites would be managed with a 1-mile buffer in which surface disturbing activities and visual intrusions that adversely affect these features would be prohibited. Rock sites would be outfitted with interpretive signing, fencing, barriers, and other activities for management of visitor use. This is the greatest buffer of surface use prohibition.

The BLM would manage NRHP-listed Properties and Districts, National Historical Landmarks, and Traditional Cultural Properties that are currently listed, eligible, or known but not yet formally designated for the NRHP as ROW-avoidance areas, would apply CSU stipulations for fluid mineral leasing, and would close these areas to mineral material disposal.

Alternative C would establish 9 additional ACECs to protect cultural resources. These ACECs are discussed in detail in **Section 4.5.1**, Areas of Critical Environmental Concern.

Alternatives C, D, and E would manage areas with high cultural site densities, such as playa lake areas and valleys, on a landscape level. These Alternatives would promote educational, research, and interpretation opportunities for the cultural resources, as well as pursue funding for data synthesis, and pursue archaeological district National Register and traditional cultural property nominations. These additional and landscape approach to managing cultural resources would be more protective than Alternative A.

All of the alternatives would implement the Native American Graves Protection and Repatriation Act. Alternative C would close areas known to contain human burials to surface disturbing activities when feasible, and appropriate federal, state, and/or local laws would be followed when disturbance is necessary. The preferred management option of known or discovered human remains under Alternative C would be in-place preservation, but archaeological excavation may be allowed.

Effects under Alternative D

Cultural and historic rock art sites would be managed with a 0.125-mile buffer in which surface disturbing activities and visual intrusions that adversely affect these features would be prohibited. Rock sites would be outfitted with interpretive signing, fencing, barriers, and other activities for management of visitor use. The buffer of disturbance prohibition under Alternative D is greater than Alternative A.

The BLM would manage NRHP-listed Properties and Districts, National Historical Landmarks, and Traditional Cultural that are currently listed, eligible, or known and not yet formally designated for the NRHP the same as under Alternative B.

Alternative D would establish 6 additional ACECs to protect cultural resources. These ACECs are discussed in detail in **Section 4.5.1**, Areas of Critical Environmental Concern.

Alternative D would manage areas with high cultural site density as Alternative C would.

The protection of human burials would be similar as those described under Alternative B. The preferred management option for known or discovered human remains would be avoidance.

Effects under Alternative E

Cultural and historic rock art sites would be managed with a 0.5-mile buffer or the visual horizon in which surface disturbing activities and visual intrusions that adversely affect these features would be prohibited. Rock sites would be outfitted with interpretive signing, fencing, barriers, and other activities for management of visitor use.

The BLM would manage NRHP-listed Properties and Districts, National Historical Landmarks, and Traditional Cultural Properties currently listed, eligible, or known and not yet formally designated for the NRHP as ROW-avoidance areas and would apply NSO stipulations for fluid mineral leasing.

Alternative E would establish three additional ACECs to protect cultural resources. These ACECs are discussed in detail in **Section 4.5.1**, Areas of Critical Environmental Concern.

Alternative E would prohibit BLM-authorized activities within the Virginia City National Historic Landmark District, would close the area to nonenergy mineral leasing, would require NSO stipulations for fluid mineral leasing, and would be managed as a ROW avoidance area, an exclusion area for wind development, and as a VRM Class III. This is the only alternative that would apply these land use restriction to the Virginia City National Historic Landmark under cultural resources management. Alternatives B, C, and D would manage this area as an ACEC, and Alternative A would not implement additional management actions.

Alternative E would also designate 15,900 acres as the Wyemaha Archaeological District to protect cultural resources. This would encompass the Grimes Point Archaeological District ACEC. This designation would provide for staff monitoring, law enforcement patrols, and the development of an interpretive center. Associated land use restrictions that would apply include recommendation for withdrawal from locatable mineral entry, closure to fluid

mineral leasing, and management as an ROW avoidance area. Alternative E would be the only Alternative that would designate the Wyemaha Archaeological District.

Alternative E would prohibit BLM-authorized activities within the Pistone site (3,100 acres) if they adversely affect local rock art resources. Additionally, the Pistone site management would include management as a ROW avoidance area, closure to mineral material disposal and fluid mineral entry, recommendation for withdrawal from locatable mineral entry, and prohibition of fire retardant chemicals.

Alternative E would manage areas with high cultural site density in the same manner as Alternative C.

Under Alternative E, protection of human burials would be the same as those described under Alternative B.

Cultural Resources: Effects from Paleontological Resources Management

Effects Common to All Alternatives

Identification and protection measures for paleontological resources may also lead to the identification and protection of cultural resources. Scientific study of these resources may provide additional information on paleo-environments and other research questions relevant to the cultural resources of the CCD.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Cultural Resources: Effects from Visual Resources Management

Effects Common to All Alternatives

VRM Class I and II designations provide protection of cultural resources where visual setting is a contributor to the significance of the property or the traditional use. Visual intrusion on the setting of cultural resources must be

considered in the Section 106 process and tribal consultation, regardless of VRM designation.

Class I. The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes with very limited management activity. The level of change by the activity to the characteristic landscape should be very low and must not attract attention.

Class II. The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

Therefore, the risk of impacts on cultural resources in VRM Class I and II areas would be indirectly reduced due to the class areas limiting surface-disturbing activities or reducing their visual intrusions on the landscape.

Effects under Alternative A

Alternative A would manage visual resources within the planning area according to the following VRM class objectives:

- Class I: 564,100 acres
- Class II: 38,300 acres
- Class III: 320, 600 acres
- Class IV: 385,700 acres

Alternative A does not provide a VRM classification for the entire planning area. In total, 602,400 acres are classified as Class I or Class II. This would protect cultural resources found in these acres. Due to the Class I rating, 564,100 acres may be indirectly protected from surface-disturbing activities which would protect surface or just below surface cultural resources.

Effects under Alternative B

Alternative B would manage visual resources within the planning area according to the following VRM class objectives:

- Class I: 564,100 acres
- Class II: 56,800 acres
- Class III: 1,379,400 acres
- Class IV: 2,803,000 acres

Alternative B would classify 620,900 acres as Class I or Class II VRM classification. This would protect cultural resources found in these acres. This total is more than Alternative A.

Effects under Alternative C

Alternative C would manage visual resources within the planning area according to the following VRM class objectives:

- Class I: 981,900 acres
- Class II: 733,900 acres
- Class III: 213,400 acres
- Class IV: 2,874,100 acres

Alternative C would classify 1,715,800 acres as Class I or Class II VRM designations. This would better protect cultural resources than Alternative A.

Effects under Alternative D

Alternative D would manage visual resources within the planning area according to the following VRM class objectives:

- Class I: 564,100 acres
- Class II: 66,400 acres
- Class III: 185,900 acres
- Class IV: 3,986,900 acres

Alternative D would designate 630,500 acres as Class I or Class II designations which would provide for less protections of cultural resources than Alternative C, but more than Alternatives A and B. In addition, Alternative B would provide for the same amount of Class I designations as Alternative A.

Effects under Alternative E

Alternative E would manage visual resources within the planning area according to the following VRM class objectives:

- Class I: 564,100 acres
- Class II: 513,600 acres
- Class III: 1,383,900 acres
- Class IV: 2,341,700 acres

Alternative E would provide for 1,077,700 acres of Class I and Class II designations which is more than Alternative A. Alternative E would manage the same number of acres classified as VRM Class I as Alternative A.

Cultural Resources: Effects from Caves and Cave Resources Management

Effects Common to All Alternatives

Identification and protection measures for caves and cave resources may also lead to the identification and protection of cultural resources. Scientific study of these resources may provide additional information on prehistoric and historic environments and other research questions relevant to the cultural resources of the CCD.

Effects under Alternative A

Alternative A would continue to manage caves and their cultural features based on current land use plan decisions, policy, and regulations which are complementary to other cultural resource management goals.

Effects under Alternative B

The BLM would develop a public outreach program to foster an appreciation for caves and their cultural resources, and would provide staff to monitor caves identified as culturally significant and heavily used by the public. This includes the Grimes Point Archaeological District, Hidden Cave, and Dynamite Cave. Implementation of public awareness of significant caves and their resources and added security would reduce the likelihood of theft and vandalism of the cultural resources associated with the caves.

Alternative B would reduce the potential for impacts on cultural resources associated with development around Dynamite Cave by implementing a 0.25-mile ROW avoidance area around the cave, closing the area to mineral material disposal, and applying for a 500-foot CSU stipulation for fluid mineral leasing. This would reduce the potential for disturbance to the cultural resources associated with Dynamite cave from ROW, mineral material, and fluid mineral development.

Alternative B would reduce the potential for impacts on cultural resources within Hidden Cave by implementing a ROW avoidance area within 500 feet of the cave, closing the area to mineral material disposal, and applying CSU stipulations within 500 feet of the cave for fluid mineral leasing. This would reduce the potential for disturbance to cultural resources associated with Hidden Cave from ROW, mineral material, and fluid mineral development.

Due to these additional measures, management of caves and cave resources under Alternative B would be more protective of cultural resources than Alternative A.

Effects under Alternative C

The BLM would develop public an outreach program to foster an appreciation for caves and their cultural resources, and would provide staff to monitor caves identified as culturally significant and heavily used by the public. This includes the Grimes Point Archaeological District, Hidden Cave, and Dynamite Cave.

Implementation of public awareness of significant caves and added security around significant caves would reduce the likelihood of theft vandalism of the cultural resources associated with the caves.

The BLM would also include significant caves on the fuels-treatment program to reduce risk of fire and increase protections of sensitive cultural resources that may be impacted by a high-fuels load.

Management under Alternative C would reduce the potential for impacts on cultural resources associated with Dynamite Cave by implementing a 0.5-mile ROW exclusion area around the cave, closing the area to mineral material disposal and fluid mineral leasing, recommending the area for withdrawal from locatable mineral entry, and closing the area to motorized travel within 500 feet of the cave.

Alternative C would prevent impacts on cultural resources associated with Hidden Cave by implementing a ROW exclusion area within 500 feet of the cave, closing the area to fluid mineral leasing and mineral material disposal, recommending the area for withdraw from locatable mineral entry, and closing the area to motorized travel within 500 feet of the cave.

Alternative C is similar to Alternatives B and D, but with greater restrictions in respect to ROW exclusion, mineral closures, travel management designations, and fuels-treatments. Alternative C would be more protective of the cultural resources associated with caves and cave resources than the other Alternatives.

Effects under Alternative D

Alternative D would protect cultural resources associated with caves from vandalism or theft by installing gates, security fencing and signs. Like Alternative C, Alternative D includes culturally significant caves in the fuels-treatment program to protect sensitive attributes that may be impacted by a high-fuels load. Alternative D would also develop public outreach programs to foster an appreciation for caves and their cultural resources, and provide staff to monitor caves identified as culturally significant and heavily used by the public.

Specific management of Hidden Cave and Dynamite Cave under Alternative D would cause the same effects on cultural resources as Alternative B. These measures would be more protective of cultural resources associated with caves than Alternative A.

Effects under Alternative E

The BLM would develop public outreach programs to foster an appreciation for caves and their cultural resources, and provide staff to monitor caves identified as culturally significant and heavily used by the public. This includes the Grimes Point Archaeological District, Hidden Cave, and Dynamite Cave. Implementation of public awareness of significant caves and added security

around significant caves would reduce the likelihood of theft and vandalism of cultural resources associated with the caves.

The BLM would also include significant caves on the fuels-treatment program to reduce risk of fire and increase protections on sensitive cultural resources that may be impacted by a high-fuels load.

Alternative E would reduce the potential for impacts on cultural resources associated with Dynamite Cave by implementing a 0.25-mile buffer of ROW avoidance area around the cave, closing the area to mineral materials disposal, and applying a 500-foot CSU stipulation for fluid mineral leasing. This would reduce the potential for disturbance to cultural resources associated with development around Dynamite Cave.

Management of Hidden Cave under Alternative E would be the same as management of the Cave under Alternative B.

Alternative E would prevent impacts on cultural resources associated with Hidden Cave by implementing a ROW exclusion area within 500 feet of the cave, closing the area to fluid mineral leasing and mineral material disposal, recommending the area for withdraw from locatable mineral entry, and closing the area to motorized travel within 500 feet of the cave. Management of Dynamite Cave under Alternative E would be the same as management of the cave under Alternative C.

Management of caves and cave resources would be more protective of associated cultural resources under Alternative E than Alternative A.

Cultural Resources: Effects from Livestock Grazing Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under Alternative A, 6,700 acres would be made unavailable for livestock grazing. This is the fewest acres unavailable for livestock grazing among the alternatives and effects from livestock grazing as described under *Nature and Types of Effects* could occur over the largest area.

Effects under Alternative B

Under Alternative B, the BLM would manage 6,100 acres as not available for livestock grazing. As described under *Nature and Types of Effects*, reducing acres available for grazing would reduce the potential for grazing related impacts. As Alternative B makes more acreage unavailable to grazing than Alternative A, it is possible that more cultural resources would be protected. However, even an estimate of the number or type of sites that could benefit from the protections is unknown at this time as the precise areas of closure are unknown.

Effects under Alternative C

Under Alternative C, 2,702,000 acres would not be available for livestock grazing, which is the largest acreage compared to the other alternatives. As was noted under Alternative B, this larger area could protect more sites or a wider variety of site types compared to Alternative A, but how many sites or specifically which types are unknown at this time.

Alternatives C, D, and E would include an emergency shut-down option to make all allotments unavailable for livestock grazing during emergency situations such as drought, fire, or a plague of insects. This would reduce the overall effect of these emergency situations on vegetation and soil resources, limiting impacts of erosion, run off, and fire to any cultural resources within an allotment.

Effects under Alternative D

Alternative D would manage 10,700 acres as not available for livestock grazing, which is greater than Alternative A and could therefore protect more potential cultural resource sites than Alternatives A.

Effects under Alternative E

Alternative E would manage the same amount of acres available and not available to livestock grazing as Alternative B. This would provide greater protection of cultural resources than Alternative A.

Cultural Resources: Effects from Geology and Mineral Management*Effects Common to All Alternatives*

Under all alternatives, 194,900 acres would be managed as closed to locatable mineral entry. This would prevent potential impacts on cultural resources from ground-disturbing activities and increased visitor use related to locatable mineral exploration and development in the closed areas.

Effects under Alternative A

Under Alternative A, 56,900 acres would be managed as closed to all mineral entry, exploration, and development, and energy development under the Classification and Multiple Use Act, the Walker Planning Area, the Carson City Urban Interface Plan, and under existing withdrawals and segregation from mineral entry that would be maintained. Alternative A would open 4,064,500 acres to nonenergy mineral leasing, 3,964,200 acres to fluid mineral leasing, and would close 839,100 acres to fluid mineral leasing, and 564,200 acres to mineral material disposal. Due to the amount of acreage open to mineral material development, management under Alternative A would have the greatest likelihood of impacts on cultural resources from mineral development as described under *Nature and Types of Effects*.

Effects under Alternative B

Alternative B would manage a similar acreage as open to fluid mineral leasing, but would manage 2,120,200 acres as open with CSU stipulations and 404,600

acres as open with NSO stipulations compared to negligible levels under current management. Alternative B would manage similar amounts of acres as open and closed to nonenergy mineral leasing, mineral material disposal, and locatable minerals as Alternative A. Due to the additional stipulations for fluid mineral leasing, Alternative B would have a lower likelihood of impacts on cultural resources than Alternative A.

Effects under Alternative C

Alternative C would open the fewest acres (**Table 2-1**) to mineral development. The BLM would manage 1,798,400 acres as open to mineral materials, 1,842,400 acres as open to nonenergy leasable minerals, and 2,721,500 acres as to fluid mineral leasing. The BLM would also petition the withdrawal of 117,500 acres from locatable mineral entry. Alternative C would have the lowest likelihood of impacts on cultural resources from mineral development, as described under *Nature and Types of Effects*.

Effects under Alternative D

Effects under Alternative D would be similar to those discussed under Alternative B.

Effects under Alternative E

Effects under Alternative E would be similar to those discussed under Alternative B. However, the BLM would close 1,785,900 acres to nonenergy leasables and 1,778,700 acres to mineral material disposal, nearly twice as much as Alternative B.

Cultural Resources: Effects from Recreation and Visitor Services

Effects Common to All Alternatives

Recreational use and access can impact cultural resources through direct disturbance, soil compaction, altered surface water drainage, erosion, intrusions to setting, and access leading to unauthorized collection or vandalism. The potential for impacts on cultural resources from recreation would increase as population and recreational use increases or is concentrated. The effect of repeated uses or visits over time could also increase the intensity of impacts due to natural processes. Monitoring and active management of SRMAs and provisions for recreational permitting can reduce the potential for impacts from overuse. Recreational opportunities deemed primitive or taking place in an overall natural environment may be less disturbing to known and unknown cultural resources due to less intensive surface disturbing activities. Recreation using motorized vehicles or large groups would generally be considered to have more potential effects on cultural resources due to the larger quantities of surface disturbance expected. Continuing and enhancing interpretation and public education can vest the public in resource protection and respect for Native Americans and cultural values

All alternatives include the following measures designed to avoid impacting cultural resources and Native American values:

- Maintaining and enhancing interpretive programs for cultural sites;
- Pursuing partnerships and agency coordination for interpretive sites;
- Ensuring that construction is compatible with landscape settings; and
- Minimizing adverse effects on cultural resources through use restrictions, permit stipulations, and mitigation measures.

Effects under Alternative A

SRMAs

Alternative A would continue to manage 2 SRMAs. These are the Alpine Indian Creek /East Fork Carson River SRMA (7,600 acres), and the Walker Lake SRMA (60,100 acres). Alternative A would not specify the type of recreation that would take place at the Alpine or Walker Lake SRMAs. In total, Alternative A would manage 67,700 acres as SRMAs.

Alternative A would not manage the Hungry Valley area as an SRMA but would continue to manage the area as open to cross-country motorized travel (27,402 acres).

ERMAs

Alternative A would not designate any ERMAs, which would not funnel OHV use and other recreational activities towards managed recreation areas, and would result in more dispersed use of the land. This would put the most cultural resources at risk for potential impact from recreation.

Effects under Alternative B

SRMAs

Alternative B would designate 6 areas as SRMAs, including Alpine (5,800 acres), Dead Camel Mountain (16,800 acres), Hungry Valley (21,600 acres), Sand Mountain (7,400 acres), Walker Lake (24,000 acres), and Wilson Canyon (500 acres). This is a total of 76,100 acres of SRMA designations.

Alternative B would designate more SRMAs than Alternative A.

Alternative B through E would manage the Alpine SRMA with emphasis on nonmotorized recreation including camping, environmental education and interpretation, reservoir access, fishing, and hiking.

Dead Camel Mountain would be designated for motorized use and a multi-use recreation area with a primary objective of providing a location for casual and permitted events that would facilitate regional tourism and activities. The BLM would manage the area as open to cross-country travel and designated staging

and camping areas would be developed and would promote OHV-based tourism.

Hungry Valley would be designated under Alternative B as an OHV based tourism area that would be open to cross-country motorized travel, would allow for organized events, and would establish designated staging and camping areas with information kiosks.

Sand Mountain would be designated for motorized and nonmotorized recreational activities while protecting sensitive resources. Alternative B would divide the Sand Mountain SRMA into three areas: the Dune Recreation Management Zone (RMZ; managed as open to motorized travel), the Desert Habitat RMZ (managed as closed to motorized travel), and the Mining District RMZ (managed as limited to existing trails). Alternative B would eliminate fee use designation, which could increase visitor use.

Walker Lake would be designated for developed and dispersed camping and recreational activities such as hiking, and equestrian and motorized trails. Walker Lake would be divided into two RMZs: Sportsman's beach (managed as limited to existing routes) and Wassuk (managed as open to motorized travel).

Wilson Canyon would be designated for recreational opportunities such as OHV touring and trail riding, developed site camping, and river access and fishing. Alternative B would develop visitor services such as trail identification and route signage, information kiosks, and visitor use maps.

ERMAs

Alternative B would designate 8 ERMAs totaling 1,678,320 acres that would provide for recreational activities and opportunities while promoting regional economic development. These ERMAs include Middlegate (268,700 acres), Mina (824,700 acres), Mustang (400 acres), Pah Rah (20,000 acres), Pine Nut (201,100 acres), Reno Urban Interface (70,600 acres), Salt Wells (292,700 acres), and 102 Ranch (120 acres).

Alternative B would designate more ERMAs than Alternative A.

102 Ranch and Mustang would be designated for casual use and dispersed recreation that emphasizes dog walking, photography, hiking, river access, and environmental education and interpretation.

The BLM would manage Middlegate for recreational activities that emphasizes long distance trail riding for ATVs, UTVs, and motorcycles. OHV recreation and tourism would be promoted, and education and interpretive signs for trail systems would be developed.

The BLM would manage Mina for recreational activities that emphasizes long distance trail riding for ATVs and UTVs. OHV recreation and tourism would be

promoted, and education and interpretive signs for trail systems would be developed.

The BLM would manage Pah Rah for mountain biking, hiking, and environmental education opportunities. Overnight camping associated with SRP activities would be prohibited, and visitor services such as trail identification and route signage would be provided.

The BLM would manage Pine Nut to provide recreational opportunities that emphasize motorized and mechanized recreation opportunities. Staging areas for recreational activities, developed camp areas, visitor services such as trail identification and route signage would be provided.

The BLM would manage the Reno Urban Interface ERMA for activities that emphasize BLM-administered land access and recreation opportunities. The Lemmon Valley Motocross area would be open and visitor services would be provided and a designated staging and camping areas would be established.

Salt Wells would be designated for casual use and dispersed recreation opportunities that emphasizes long distance trail riding for motorized and nonmotorized uses. OHV recreation and tourism would be promoted, and education and interpretive signs for trail systems would be developed.

Effects under Alternative C

SRMAs

Alternative A would designate 3 SRMAs, including Alpine (10,700 acres), Sand Mountain (3,900 acres), and Walker Lake (60,100 acres) totaling 74,700 acres. Alternative C would designate the same number of SRMAs as Alternative A.

In respect to cultural resources, Alternative C would manage the Alpine SRMA the same as Alternative B would.

Alternative C would designate the Sand Mountain SRMA to protect sensitive species habitat and Native American values as the primary resource management objectives. Alternative C would manage two RMZs within the Sand Mountain SRMA. The Dune RMZ would be open to motorized travel. The Desert Habitat RMZ would be managed as closed to motorized travel in order to protect cultural resources.

Alternative C would manage the Walker Lake SRMA for recreational activities while limiting further development of facilities or expansion of developed and primitive camping areas. Alternative C would manage 4 RMZs within the SRMA. These are Sportsman's Beach, Shoreline, Wassuk, and Gillis Range where motorized travel would be limited to existing routes. Alternative C would also prohibit the development of motorized and nonmotorized trails and would not authorize the area for commercial and competitive based recreational activities.

Alternative C would decommission the Dead Camel Mountain and would rehabilitate the hillside. After reclamation is complete, cultural resources would no longer be at risk for impacts from visitor use and motorized travel.

ERMAs

Alternative C would designate 15 ERMAs totaling 1,528,760 acres that would provide for recreational activities and opportunities with an emphasis on protecting cultural, historical, and natural resources. These ERMAs include Bagley Valley (2,600 acres), Dry Valley (84,100 Acres), Faye-Luther (40 acres), Middlegate (195,300 acres), Mina (486,400 acres), Mustang (400 acres), Pah Rah (20,000 acres), Peterson (42,200 acres) Pine Nut (201,100 acres), Reno Urban Interface (91,000 acres), Salt Wells (113,700 acres), Singatse (174,900 acres), Virginia Mountains (68,100 acres), Virginia Range (48,800 acres) and 102 Ranch (120 acres).

In respect to cultural resources, Alternative C would manage Mina, Pah Rah, and Pine Nut ERMAs the same as Alternative B would.

The BLM would manage 102 Ranch and Mustang for casual use and dispersed recreation opportunities that emphasized dog walking, photography, nature observation, hiking, river access and environmental education and interpretation.

The BLM would manage Bagley Valley for passive recreation opportunities including backpacking, dispersed camping, fishing, mountain biking, motorized and nonmotorized recreation. Bagley Valley would be managed as closed to motorized travel with mechanized travel limited to existing routes.

The BLM would manage Dry Valley for dispersed recreation opportunities including hiking, mountain biking, OHV and equestrian use, and dispersed camping. Mechanized travel would be limited to trails, and trail identification and route signs would be provided.

The BLM would manage Faye-Luther for day use recreation opportunities, emphasizing nonmotorized activities including hiking, biking, dog walking, nature observation, photography and interpretation. Alternative C would prohibit motorized and mechanized SRP based activities, overnight camping, and would be managed as closed to motorized use.

Middlegate ERMA would be designated for recreational activities that emphasizes long distance trail riding for ATVs, UTVs, and motorcycles. Activities that adversely impact cultural resources would not be authorized.

The BLM would manage Petersen for dispersed recreation opportunities emphasizing equestrian based activities, hiking, mountain biking and backpacking. Petersen would be managed as closed to motorized and mechanized travel, and no SRPs would be authorized.

The Reno Urban Interface ERMA would be designated for recreational activities that emphasize BLM-administered land access and recreation opportunities. The Lemmon Valley Motocross area would be eliminated, and competitive and commercial motorized-events and activities would be prohibited.

The Salt Wells ERMA would be designated for casual use and dispersed recreation opportunities that emphasizes long distance trail riding for motorized and nonmotorized uses. SRPs for commercial, competitive, organized events, or activities that would adversely impact cultural resources would not be authorized.

The Singatse ERMA would be designated for dispersed motorized opportunities. SRP events allowing for commercial motorized activities and organized groups would be prohibited.

The Virginia Mountains would be designated for recreational activities while providing emphasis on protection for cultural, historical, and natural resources. Motorized SRP events, activities, and organized groups would be prohibited.

The Virginia Range ERMA would be designated for recreational activities while providing emphasis on protection for cultural, historical, and natural resources. Visitor services such as route designation would be provided. Competitive SRPs would be prohibited, and the ERMA would be managed as closed to mineral material disposal.

Effects under Alternative D

SRMAs

Alternative D would designate 4 SRMAs totaling 67,100 acres, including Alpine (7,400 acres), Dead Camel Mountain (37,400 acres), Hungry Valley (21,800 acres), and Wilson Canyon (500 acres).

Alternative D would designate more SRMAs than Alternative A.

In respect to cultural resources, Alternative D would manage the Alpine and Wilson Canyon SRMAs the same as Alternative B would.

Alternative D would manage the Dead Camel SRMA similar to Alternative B. In addition Alternative B would manage the motorized route-system for 4-wheel drive vehicles, motorcycles, ATVs, and UTVs, as well as an nonmotorized route system for mountain bikes and equestrian uses.

Alternative D would manage the Hungry Valley SRMA as limited to motorized travel, with the Moonrocks area open to motorized travel, and would develop up to three separate camp areas.

ERMAs

Alternative D would designate 6 ERMAs totaling 292,620 acres that would address recreational issues specific to BLM-administered lands and the urban interface. These ERMAs include Faye-Luther (600 acres), Mustang (400 acres), Pah Rah (20,000 acres), Pine Nut (201,100 acres), Reno Urban Interface (70,400 acres), and 102 Ranch (120 acres).

Alternative D would designate more ERMAs than Alternative A.

In respect to cultural resources, the BLM would manage Mustang, 102 Ranch, Pine Nut, Pah Rah, and the Reno Urban Interface ERMAs the same as they would under Alternative B.

The BLM would manage cultural resources within Faye-Luther ERMA the same as it would under Alternative C.

Effects under Alternative E

SRMAs

Alternative E would designate 6 SRMAs totaling 106,100 acres including Alpine (7,700 acres), Dead Camel Mountain (37,400 acres), Hungry Valley (16,200 acres), Sand Mountain (19,700 acres), Walker Lake (24,600 acres), and Wilson Canyon (500 acres).

Alternative E would designate more SRMAs than Alternative A.

In respect to cultural resources, Alternative E would manage the Alpine and Wilson Canyon SRMAs the same as Alternative B would.

Alternative E would manage the Dead Camel Mountain SRMA as an off-road motorcycling area as well as a casual area for motorized use and permitted OHV events. Alternative E would manage the north half of the SRMA as an area open to motorized travel, and the southern half of the SRMA as limited to existing routes. Alternative E would not promote tourism, but would allow for competitive recreation and OHV race corridors.

Alternative E would manage the Hungry Valley SRMA the same as Alternative D would, except that competitive rock-crawling SRPs within the Moonrocks RMZ and at Warm Springs Mountain would be prohibited.

Alternative E would designate the Sand Mountain SRMA for motorized recreational opportunities as the primary resource management objectives while protecting sensitive species habitat, Native American values, and unique geologic values, while providing opportunities for nonmotorized recreation activities. Alternative E would continue fee collections as necessary for adequate management and law enforcement staffing. Alternative E would manage the Sand

Springs Pony Express Station and NHT for historical interpretation. This would protect associated cultural resources.

Alternative E would designate 4 RMZs within the Sand Mountain SRMA: the Dune RMZ would open to motorized travel, the Desert Habitat RMZ would be managed as closed to motorized and mechanized travel, the Trail Rides RMZ would be limited to designated trails, and the Mining District RMZ as limited to existing trails.

Alternative E would designate the Walker Lake SRMA for developed and dispersed camping opportunities with an emphasis on water based and nonmotorized land based related activities, and would develop hiking and equestrian trails. Alternative E would facilitate community based recreation and tourism events and would prohibit the collection of non-renewable resources, such as rocks, mineral specimen, fossils, and semi-precious stones.

ERMAs

Alternative E would designate 15 ERMAs totaling 2,085,730 acres that would meet the demand for recreational opportunities, resource protection, and multiple use management. These ERMAs include Bagley Valley (2,600 acres), Dry Valley (83,000 Acres), Faye-Luther (110 acres), Middlegate (268,700 acres), Mina (824,700 acres), Mustang (400 acres), Pah Rah (20,000 acres), Petersen (42,000 acres) Pine Nut (201,000 acres), Reno Urban Interface (70,600 acres), Salt Wells (280,400 acres), Singatse (174,900 acres), Virginia Mountains (68,100 acres), Virginia Range (48,800 acres) and 102 Ranch (120 acres).

Alternative E would designate more ERMAs than Alternative A.

In respect to cultural resources, Alternative E would manage the 102 Ranch, Mustang, Mina, Pah Rah, Pine Nut, the Reno Urban Interface, and Salt Wells, ERMAs as Alternative B would.

In respect to cultural resources, Alternative E would manage Bagley Valley, Dry Valley, Faye-Luther, and Virginia Mountains as Alternative C would.

Middlegate ERMA would be designated for casual use and dispersed recreation opportunities that emphasizes long distance trail riding for ATVs, UTVs, and motorcycles. Visitor services such as trail identification and route signage and information would be provided.

The BLM would manage Mina for casual use and dispersed recreation opportunities that emphasizes long distance trail riding for ATVs and UTVs. Visitor services such as trail identification and route signage and information would be provided.

The BLM would manage Petersen for dispersed recreation opportunities emphasizing equestrian based activities, hiking, mountain biking and backpacking.

The BLM would manage Petersen as closed to motorized travel with mechanized travel limited to existing routes, and competitive motorized events would be prohibited.

The Singatse ERMA would be designated for dispersed motorized opportunities with an emphasis on OHV touring, trail riding, and dispersed camping. OHV staging areas and trailheads would be established.

The Virginia Range ERMA would be designated for recreation opportunities that emphasize both motorized and nonmotorized recreation uses. Equestrian use east of Washoe Lake, mountain biking north of Centennial Park, and OHV touring and trail riding east of the Jumbo staging area would be emphasized. Visitor services such as trail identification and kiosks would be provided, and SRPs that do not involve mass starting would be authorized.

Cultural Resources: Effects from Comprehensive Travel and Transportation Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would manage 3,840,300 acres as open to cross-country travel, 31,800 acres as closed to motorized and mechanized travel, 6,900 acres as closed to motorized travel with mechanized travel limited to existing routes, and 924,300 acres as limited to existing roads for motorized travel.

Overall, Alternative A would place the fewest restrictions on travel management by acre of the alternatives, and would result in the greatest potential for impacts on cultural resources as described under *Nature and Types of Effects*.

Effects under Alternative B

Alternative B would manage 95,300 acres as open to cross-country travel, 26,700 acres as closed to motorized and mechanized travel, and 4,300 acres as closed to motorized travel with mechanized travel limited to existing routes, and 4,677,000 acres as limited to existing roads for motorized travel.

Effects under Alternative C

Alternative C would manage 1,300 acres as open to cross-country travel, 598,000 acres as closed to motorized and mechanized travel, 1,190,500 acres as closed to motorized travel with mechanized travel limited to existing routes, and 3,013,500 acres as limited to existing roads for motorized travel.

Effects under Alternative D

Alternative D would manage 22,700 acres as open to cross-country travel, 30,600 acres as closed to motorized and mechanized travel, 1,600 acres as

closed to motorized travel with mechanized travel limited to existing routes, and 4,748,400 acres as limited to existing roads for motorized travel.

Effects under Alternative E

Alternative E would manage 55,700 acres as open to cross-country travel, 24,100 acres as closed to motorized and mechanized travel, 6,200 acres as closed to motorized travel with mechanized travel limited to existing routes, and 4,717,300 acres as limited to existing roads for motorized travel.

Cultural Resources: Effects from Lands and Realty

Effects Common to All Alternatives

All alternatives include provisions to retain and acquire lands that contain significant cultural resources, to maintain access to resources, and to reduce unauthorized uses allowing for federal protection of resources.

Construction of ROWs, leases and permits for development projects could expose unidentified cultural resources to erosion and affect the visual settings of historic sites. Areas identified as ROW exclusion would prohibit the construction of new ROWs, and areas identified as ROW avoidance would provide more protections from ROW construction than areas identified as open to ROW placement. This would provide some protections to potential cultural resources. Impacts on cultural resources from all lands and realty actions would be subject to further review. All ROWs would be subject to BMPs, standard operating procedures, stipulations, restrictions, and mitigation measures, would be implemented to reduce potential impacts.

Prior to disposal, the considered area would need to be surveyed for cultural resources and a determination made whether protective covenants would be needed for cultural resources. However, there could still be a slight risk of moving cultural resources out of federal ownership into private ownership if public lands are disposed of.

Effects under Alternative A

Alternative A would manage 564,100 acres as ROW exclusion, and would not manage any acres as ROW avoidance, and 179,700 acres of BLM-administered lands would be identified for disposal. Land Use Authorizations and management under Alternative A would provide the least protection for cultural resources from the potential effects described under *Nature and Types of Effects*.

Effects under Alternative B

Alternative B would manage 580,000 acres as ROW exclusion (which is similar to Alternative A) and 1,195,800 acres as ROW avoidance, totaling 1,775,800 acres of land restriction that would provide protection of cultural resources from ROW construction. This is more than Alternative A. Under this Alternative, 273,500 acres of BLM-administered lands would be identified for disposal, which is greater than Alternative A. Overall, management under

Alternative B would be more protective of cultural resources than Alternative A.

Effects under Alternative C

Alternative C would manage 2,675,800 acres as ROW exclusion and 369,300 acres as ROW avoidance totaling 3,045,100 acres of land restriction. This would provide the most protections of cultural resources from potential impacts of ROW construction as described under *Nature and Types of Effects* for lands and realty development. Additionally, Alternative C would not propose any BLM-administered land for disposal. This would eliminate the potential for transfer of cultural resources out of federal ownership.

Effects under Alternative D

Alternative D would manage 564,100 acres as ROW exclusion and 1,226,100 acres as ROW avoidance, totaling 1,790,200 acres of land use restriction that would protect cultural resources. This is more than Alternative A. The acres identified for disposal under Alternative D would be 332,500.

Effects under Alternative E

Alternative E would manage 605,900 acres as ROW exclusion and 1,448,200 acres as ROW avoidance totaling 2,054,100 acres of land restrictions that would prevent impacts on cultural resources. This is more than Alternative A. The acres identified for disposal under Alternative E would be 267,200, which is similar to Alternative B.

Cultural Resources: Effects from Renewable Energy

Effects Common to All Alternatives

Potential impacts from renewable energy projects (solar, wind, and biomass) and associated ROWs include those direct impacts from ground-disturbing activities and erosion, and indirect impacts from intrusions to setting, and access, leading to unauthorized collection or vandalism as described in the *Nature and Type of Effects* section. The siting of wind energy facilities could affect the visual setting of historic trails and other cultural resources. All permits and ROWs would be subject to stipulations, restrictions, and mitigation measures. This would reduce the potential for impacts on cultural resources. Under all alternatives the development of renewable energy in a timely manner to meet national, regional, and local needs would be encouraged.

Effects under Alternative A

Under current management, no avoidance areas for wind energy have been designated, and approximately 900,000 acres (**Table 2-1**) are variance areas for solar projects. Variance areas allow development, but require provisions to protect resources in the area. Outside variance areas, utility-scale solar energy development is not permitted. Alternative A would provide little protection to cultural resources from the effects of ROW development as described under *Nature and Types of Effects*.

Effects under Alternative B

Alternative B would manage 773,400 acres as variance areas for utility-scale solar development, and would manage 1,220,200 acres as ROW avoidance for wind energy projects, including lands within VRM Class 1 or Class 2. Alternative B would grant land use authorizations for wind and solar energy, and biomass monitoring and development. Under Alternative B, the BLM would implement more restrictions on renewable energy development than under Alternative A. This would better protect potential cultural resources than Alternative A.

Effects under Alternative C

In general, Alternatives C, D, and E would grant land use authorizations for wind and solar energy, and biomass monitoring while protecting resources. Alternative C would manage 578,400 acres as variance areas for utility-scale solar development, and 2,073,200 acres as ROW exclusion areas for wind energy projects, including lands managed as VRM Class 1 and Class 2. Alternative C would also manage 14,700 acres in the Virginia City National Landmark Historic District ACEC as ROW exclusion. Under Alternative C, the BLM would implement more restrictions on renewable energy development than under Alternative A. This would better protect potential cultural resources than Alternative A.

Effects under Alternative D

Alternative D would manage 672,100 acres as variance areas for utility-scale solar energy, and 1,228,100 acres as ROW avoidance areas for wind energy projects, including lands within VRM Class 1 and Class 2. Under Alternative D, the BLM would implement more restrictions on renewable energy development than under Alternative A. This would better protect potential cultural resources than Alternative A.

Effects under Alternative E

Alternative E would manage 629,900 acres as variance areas for utility-scale solar energy, and 629,900 acres as ROW avoidance areas for wind energy projects, including lands within VRM Class 1 and Class 2. Under Alternative E, the BLM would implement more restrictions on renewable energy development than under Alternative A. This would better protect potential cultural resources than Alternative A. Alternative E would also manage 14,700 acres in the Virginia City National Landmark Historic District ACEC as a ROW exclusion area.

Cultural Resources: Effects from Areas of Critical Environmental Concern*Effects Common to All Alternatives*

Managing lands as ACECs could directly or indirectly provide long-term protection of cultural resources by restricting incompatible uses. Protecting cultural and natural resource values in ACECs would also decrease the risk of impacts on identified or unidentified cultural resources present. Under all alternatives, the risk of impacts on cultural resources from ground-disturbing

activities, erosion, intrusions to setting, and access leading to unauthorized collection or vandalism would be reduced in these areas by restricting other actions.

Effects under Alternative A

Under Alternative A, 6 ACECs would continue to be managed, totaling 21,800 acres. Of these ACECs the Pah Rah Basin Petroglyph would be specifically designated to protect cultural resources. The other ACECs would indirectly protect cultural resources as described under effects common to all. Alternative A would manage the fewest acres as ACECs.

Effects under Alternative B

Under Alternative B, 4 ACECs would continue to be managed and 9 ACECs would be proposed for designation, totaling 371,170 acres. Of the ACECs and proposed ACECs, the Pah Rah High Basin Petroglyph, Black Mountain/Pistone Archaeological District, Fox Peak Cultural, Grimes Point Archaeological District, Namazii Wunu Cultural, Tagim aša Cultural, and the Virginia City National Landmark Historic District would be designated to protect cultural resources. The other ACECs would indirectly protect cultural resources as described under effects common to all. Alternative B would manage more acres as ACECs than Alternative A.

Effects under Alternative C

Alternative C would continue to manage 5 ACECs and would propose the designation of an additional 18 ACECs, totaling 786,270 acres. Of these, the Pah Rah High Basin Petroglyph, and the proposed Black Mountain/Pistone Archaeological District, the Fox Peak Cultural ACEC, Grimes Point Archaeological ACEC, Namazii Wunu Cultural ACEC, Tagim aša Cultural, and the Virginia City National Landmark Historic District ACEC would be designated specifically to protect cultural resources. Restrictions on other ACECs designated to protect other resources would also inadvertently protect any potential cultural resources within them as described under effects common to all. Alternative C would manage more acres as ACECs than any of the other Alternatives.

Effects under Alternative D

Alternative D would continue to manage 3 ACECs and would propose the designation of an additional 8 ACECs totaling 180,000 acres. Of these, the existing Pah Rah High Basin Petroglyph ACEC and the proposed Black Mountain/Pistone Archaeological ACEC, the Fox Peak Cultural ACEC, the Grimes Point Archaeological District ACEC, the Tagim aša Cultural ACEC, and the Virginia City Landmark Historic District ACEC would be designated to protect cultural resources. The designation and management of the other ACECs would indirectly protect cultural resources as described under effects common to all. Alternative D would manage more acres as ACECs than Alternative A.

Effects under Alternative E

Alternative E would continue to manage 4 ACECs and would propose the designation of an additional 4 ACECs for a total of 82,770 acres. Of these, the BLM would manage the existing Pah Rah High Basing Petroglyph ACEC, the proposed Fox Peak Cultural ACEC, and the Grimes Point Archaeological ACEC to protect cultural resources. The other ACECs would indirectly protect cultural resources as described under effects common to all. Alternative E would manage more acres as ACECs than Alternative A.

Cultural Resources: Effects from Back Country Byways*Effects Common to All Alternatives*

There are no effects common to all alternatives.

Effects under Alternative A

Under Alternative A, the Fort Churchill Back Country Byway would continue to be managed. This is a 67 mile Type 1 and Type 2 byway going from Fort Churchill to Wellington. Fort Churchill is an historic town and a frontier fort. Effects from these allocations and management actions would be the same as those described above in *Nature and Types of Effects*.

Effects under Alternative B

Alternative B would extend the Fort Churchill Back Country Byway to Dayton. It would also review and update the classification of the byway type and the existing signs while emphasizing the Carson River and Nevada history.

Alternative B would also designate the Marietta Back Country Byway route emphasizing the Candelaria mining district, Teals Marsh, and the Marietta Wild Burro Range to provide for exploration of Nevada history and culture. The completed route would be added to the BLM maintained route system.

Finally, Alternative B would designate the New Pass Hawthorne Back Country Byway which would promote and highlight the values of Nevada's western heritage, including mining and livestock ranching.

The added areas of allocated Byways and additional management may provide for added appreciation and understanding of the cultural resources along these routes, but could also open these cultural resources up to more visitors and an increased risk for theft, damage, or vandalism.

Effects under Alternative C

Alternative C would rescind the Fort Churchill Back Country Byway and would remove the trails signs. This would protect the cultural resources along this byway by limiting visitor use, but would also restrict the public's opportunities to learn about the history of Nevada. Alternative C would designate the Marietta Back Country byway, but would exclude the historic mining districts in order to protect historical resources. Alternative C would designate the New

Pass to Hawthorne Back Country Byway to promote mining and livestock ranching with an auto tour route that provide protection of historical or cultural resources through selective information. Adding these segments of allocated Byways and additional management may provide for added appreciation and understanding of cultural resources along these routes, but my also open these areas up to negative impacts of increased visitor use as described under *Nature and Types of Effects*.

Effects under Alternative D

Alternative D would not manage the Fort Churchill Back Country Byway, or designate the Marietta Back Country Byway or the New Pass to Hawthorne Back Country byway. This would result in protection of cultural resources along these routes from increased visitor use, but could also impact these resources through lack of management and maintenance.

Effects under Alternative E

Management of Back Country Byways under Alternative E would be the same as those described under Alternative B. Alternative E would additionally manage the Fort Churchill Back Country Byway to emphasize multiple use management and provide for mitigation of user conflicts and resource damage.

Cultural Resources: Effects from National Trails

Effects Common to All Alternatives

National Historic Trails (NHTs) are cultural resources. Management of NHTs includes consideration of cultural, recreation, visual and natural landscape elements, values, qualities and settings. Under all alternatives the historical trails and associated historic sites and setting would be preserved and protected for public use and enjoyment. Potential effects resulting from the proposed management measures are described in both the cultural resources and NHT sections.

Effects under Alternative A

Alternative A would manage NHTs to ensure the protection of trail resources and preserve their interpretation and other public use. These sites would be maintained in public ownership. Segments of the NHTs would be evaluated for inclusion in the NRHP based on integrity decided by a mixture of location, design, setting, materials, workmanship, feeling, and association. All of these actions would protect the trail remnants, associates sites, and landscape setting.

California National Historic Trail

The California NHT has one high potential historic site, and 2 high potential route segments. The BLM would manage the Fernley Ruts high potential historic site under a historic preservation and access easement under all the alternatives. Alternative A would not provide for specific management of the high potential route segments; therefore, there would be a lesser likelihood for disturbance to

these trail segments from theft of vandalism, and a greater likelihood of degradation of these trail segments from lack of maintenance management.

Pony Express National Historic Trail

Under all alternatives the Pony Express NHT has 2 high potential historic sites: the Cold Springs Station/East Gate Station and the Sand Springs Station.

Alternative A would designate appropriate sites for public use, provide access and information, and promote visitation and interpretation of the Stations. Alternative A would maintain the self-guided interpretation and informational signs at the Stations and would scientifically excavate, stabilize, and develop the stations as public interpretive sites. This would improve the public interpretation of the sites, and may improve appreciate and value of the sites. Additional signs and management to promote these locations could also result in theft or vandalism of these cultural resources.

Grimes Point National Recreation Trail

Under Alternative A, the Grimes Point Recreation trail was not designated with specific management identified, and therefore would not provide additional protections of the cultural resources here, nor promote public visitation.

Effects under Alternative B

Alternatives B through E would manage NHTs to preserve the historic and scenic values and the cultural landscapes and viewsheds associated with them.

Alternative B and E would evaluate high-potential sites and high-potential segments of the NHTs for inclusion into the NRHP based on resources, qualities, values, and associated settings along with the primary uses identified.

Alternative B would manage NHTs as VRM Class II (0.25-mile buffer on either side of the centerline) and as a ROW avoidance area (0.25-mile buffer around the center line), and would mitigate for direct and indirect adverse effects on eligible, unevaluated, or high-potential segments and associated sites through avoidance, project redesign, data collection, interpretation, public education, or other means. These land use restrictions would prevent impacts from lands and realty as described under Lands and Realty. Additionally, new audible and atmospheric effects will not exceed current levels where feasible, which could result in more accurate historic interpretation of the cultural resources in these areas.

Alternative B would open the NHT corridors to mineral material sales and disposals as long as the actions are compatible with VRM classification and the historic values. This may result in impacts from minerals development as described under *Nature and Types of Effects*.

NHTs would be improved by developing and enhancing significant segments and sites by installing directional signs to the trail on main roads, trail markers at

trail traces, and interpretive signs. Recreational opportunities consistent with the historic value of the NHTs would be provided, and facilities would be developed outside the trail corridor where feasible to protect resource values, provide for visitor safety, and support selected use opportunities. These added maintenance management would protect cultural resources from natural degradation, but would increase visitor use, which may result in damage to the cultural resources from theft or vandalism.

California National Historic Trail

Under Alternative B, management of the Fernley Ruts would be the same as Alternative A.

Alternative B would manage the Mickey Canyon and the Humboldt Sink to Dayton high potential route segments to protect their historic values and to mitigate actions that would adversely affect the NHT through avoidance, project redesign, data collection, interpretation, public education, or other means. This would result in greater protection of the cultural resources associated with these sites.

Pony Express National Historic Trail

Under Alternative B, the BLM would manage the designated Pony Express NHT as a Cultural Resource, which would result in more protective management actions (See Cultural Resources).

Grimes Point National Recreation Trail

Alternatives C, D, and E would manage the Grimes Point as a 0.74-mile trail consistently with secretarial designation. The following management actions would be implemented: a management plan would be developed to include maintenance, interpretation, and monitoring of petroglyphs, at minimum, an annual inspection would occur to document the integrity of the petroglyph art, interpretive trail markers would be maintained and brochures would be provided, site steward monitoring with the Nevada Rock Art Foundation or other similar group would continue, and the Fallon Paiute Shoshone Tribe and Reclamation would be coordinated with for management of the trail. Increased management and maintenance of the trail would reduce the potential for natural decline and degradation of these resources, but increase in visitor use may increase the risk of vandalism or theft from these sites.

Effects under Alternative C

Alternative C and D would evaluate trail-related sites and segments of the NHTs for inclusion into the NRHP based on resources, qualities, values, and associated settings along with the primary uses identified.

Alternative C would manage NHTs as VRM Class II (2.5-mile buffer on either side of the centerline) and as a ROW avoidance area (2.5-mile buffer around the center line). This would reduce the potential for impacts on these areas from ROW construction as described under Lands and Realty. Alternative C would

also mitigate for direct and indirect adverse effects on eligible, unevaluated, or high-potential segments and associated sites through avoidance, project redesign, data collection, interpretation, public education, or other means. This would indirectly protect the cultural resources in these areas. As under Alternative B, new audible and atmospheric effects will not exceed current levels along NHTs, and additionally the BLM would seek opportunities to reduce noise levels.

Alternative C would also close the NHT corridor to nonenergy mineral leasing, mineral materials, and fluid mineral leasing within a 2.5-mile buffer which would prevent impacts on cultural resources in the corridor from mineral development as described under *Nature and Types of Effects*.

Alternative C, D, and E would provide recreation opportunities consistent with the historic values of the NHTs, develop facilities outside the trail corridor when feasible to protect resource values, provide for visitor safety, and support selected use opportunities. Facility development within the trail corridor would only occur when needed to protect trail integrity or resources, or to establish an NHT recreation retracement routes.

California National Historic Trail

Alternative C would manage the Fernley Ruts as Alternative A would with the addition of enhanced protection measures such as signs and fencing where appropriate. Alternative C would manage the Mickey Canyon and Humboldt Sink to Dayton historical NHT segments to protect their historic values and would not allow actions that would adversely affect the NHT.

Pony Express National Historic Trail

Under Alternative B, the BLM would manage the designated Pony Express NHT as an ACEC, which would result in more protective management actions (See Sand Springs Desert Study ACEC).

Grimes Point National Recreation Trail

The BLM would manage the Grimes Point NRT as discussed under Alternative B.

Effects under Alternative D

Alternative D would designate new segments of NHTs into the NRHP and manage NHTs as Alternative C would.

Alternative D would manage NHTs as Alternative B would.

Alternative D and E would develop and enhance significant segments by installing directional signs to trails segments from main roads, trail markers at trail traces, and interpretive signs. Alternatives D and E would also pursue legal access for public visitation to trail segments and would continue to support

stewardship programs and partnerships to lead trail tours, monitor sites, and generally assist with management.

California National Historic Trail

Alternative D would manage the Fernley Ruts the same as Alternative A and would manage the Mickey Canyon and Humboldt Sink to Dayton high potential historic sites the same as Alternative B would.

Pony Express National Historic Trail

Under Alternative D, the Pony Express NHT would not be managed under any directives other than those prescribed generally for national trails, as described under General Management.

Grimes Point National Recreation Trail

The BLM would manage the Grimes Point NRT as discussed under Alternative B.

Effects under Alternative E

Alternative E would designate new segments of the NHTs into the NRHP as Alternative B would.

Alternative E would manage NHTs as VRM Class II (1-mile buffer on either side of the centerline) and as a ROW avoidance area (1-mile buffer around the center line), and would mitigate for direct and indirect adverse effects on eligible, unevaluated, or high-potential segments and associated sites through avoidance, project redesign, data collection, interpretation, public education, or other means. Additionally, new audible and atmospheric effects will not exceed current levels where feasible.

Alternative E would close high potential historic sites and high potential route segments along the NHT corridor to nonenergy and fluid mineral leasing and mineral material disposal within a 1-mile buffer on either side of the centerline. The remainder of the NHT corridor would remain open to leasing and development as long as the actions were compatible with the historic values.

Alternative E would manage NHT for public use the same as Alternative D would.

California National Historic Trail

Alternative E would manage the Fernley Ruts the same as Alternative C and would manage the Mickey Canyon and Humboldt Sink to Dayton high potential historic sites the same as Alternative B would.

Pony Express National Historic Trail

Under Alternative B, the BLM would manage the designated Pony Express NHT as an SRMA, which would result in more protective management actions (See SRMAs and Cultural Resources).

Grimes Point National Recreation Trail

The BLM would manage the Grimes Point NRT as discussed under Alternative B.

Cultural Resources: Effects from Wilderness Study Areas*Effects Common to All Alternatives*

Managing acres as WSAs to maintain wilderness characteristics would restrict surface-disturbing activities and would indirectly reduce the potential for direct disturbance of cultural resources, alterations to visual and aural setting, and access leading to vandalism and unauthorized collecting. If Congress releases the WSAs and they are not located within a designated ACEC, the risk of impacts on cultural resources from future surface-disturbing activities and other incompatible uses would increase.

Effects under Alternative A

Effects would be the same as those described under *Effects Common to All Alternatives*.

Effects under Alternative B

If WSAs are released by Congress, the BLM would manage the areas as VRM Class II. This would result in effects on cultural resources as described in the VRM section above. While this VRM classification would provide some protection of the lands once a part of the WSAs, Wilderness Area designation by Congress would be more protective.

Effects under Alternative C

If WSAs are released by Congress, the BLM would manage most of the areas as VRM Class II. All of the areas would not be authorized for motorized SRPs, would be managed as closed to nonenergy mineral leasing, mineral material disposal, and fluid mineral leasing, would be recommended for withdrawal from locatable mineral entry, and would be managed as a ROW exclusion area. This would result in protection of any potential cultural resources within these areas from mineral develop, and ROW construction, as described under *Nature and Types of Effects*.

These management actions should a WSA be released by congress would be more protective of potential cultural resources than Alternatives A and B, but retaining Wilderness Area designation would be more protective of any potential cultural resources within these areas.

Effects under Alternative D

If WSAs are released by Congress, the BLM would manage the areas as VRM Class II. The BLM would manage the Carson Iceberg area as closed to fluid mineral leasing and as a ROW avoidance area.

Management actions are similar to Alternative B in that the VRM classification would retain some protection of cultural resources should WSA designation be released by Congress, as described under the Visual Resources section, above. Alternative D would be more protective of potential cultural resources in the Carson Iceberg area than Alternative B due to the additional land use restrictions.

Effects under Alternative E

If WSAs are released by Congress, the BLM would manage most of the areas as VRM Class II, and all of the areas would be managed as closed to fluid mineral leasing and as ROW avoidance areas.

The BLM would manage the Carson Iceberg as VRM Class I. The BLM would manage the portion of Job Peak that overlaps with the Fox Peak Cultural ACEC (43,300 acres) as part of that ACEC.

Due to these land use restrictions and the conversion of the Carson Iceberg to an ACEC if it were released from WSA designation by Congress, Alternative D would be more protective of potential cultural resources than Alternative A.

Cultural Resources: Effects from Back Country Wildlife Conservation Areas

Effects under Alternative A

BCWCAs would not be designated under Alternative A, so impacts or protection of cultural resources from Back country Wildlife Conservation Area designation would not occur.

Effects under Alternative B

Effects would be the same as those described in Alternative A.

Effects under Alternative C

BCWCAs would be designated to safeguard fish and wildlife habitat, existing dispersed non-motorized recreation opportunities, and access to back country areas. Alternative C would manage 817,800 acres as BCWCAs and would manage the areas as ROW exclusion except within existing ROWs, as restricted for livestock grazing, as closed to mineral material disposal and nonenergy mineral leasing, and with an NSO stipulation for fluid mineral leasing. Additionally, the BLM would manage BCWCAs to protect PPMA and PGMA. The BLM would conduct fire management within these areas to mimic natural fire regimes.

These land use restrictions would reduce the potential for disturbance to cultural resources in comparison to areas without these land restrictions in place. Therefore, management of Back Country Wildlife Conservations areas under Alternative C would be more protective of cultural resources than the other Alternatives.

Effects under Alternative D

Effects would be the same as those described in Alternative A.

Effects under Alternative E

Effects would be the same as those described in Alternative A.

Cultural Resources: Cumulative Effects

Table 4-1 lists the reasonably foreseeable cumulative actions for the CCD.

Invasive weeds are expected to continue to spread across the landscape, carried by wind, humans, machinery, and animals, and alter current vegetation communities which may reduce soil stability and increase fire regimes, which may result in increased threat to cultural resources. The BLM currently manages weed infestations through integrated weed management, including biological, chemical, mechanical, and educational methods. Vegetation treatments involving the use of mechanical, biological, and chemical treatments have been used in the past on both private and public rangelands, and would likely continue in the future. These treatments can impact unknown cultural resources through movement, damage, and destruction.

Wildfires have exposed large areas where vegetation has been consumed increasing erosion and illegal gathering potential for cultural resources. Trends indicate that the number of wildfires will continue to gradually increase based on climate, conversion of habitat to areas dominated by nonnative, invasive species, and increased potential for human-caused fires due to population growth and increases in recreation uses. The implementation of ESR on areas burned by wildfire would continue based on the number of acres burned. ESR treatments would continue to be prioritized to provide for human life and safety, soil/water stabilization, restoration of important habitat for special status species, and to deter establishment of invasive plants. Fire control and suppression involve ground-disturbing activities that have also directly impacted cultural resources by damaging or destroying features and altering the spatial relationships of archaeological sites. Impacts on cultural resources from fire and fire suppression have been reduced in recent years by BLM fire management personnel working closely with cultural resource specialist to avoid damage to cultural resource sites.

Construction of fuel breaks with emphasis at a landscape scale would reduce fire spread potential, thereby reducing the size of burned areas and potential damage to cultural resources. However, since more fires are anticipated in the future and the numbers of acres burned are anticipated to be similar to past and present, impacts on cultural resources from wildfire and wildfire suppression would be similar to past and present. Continued cooperation between fire management and cultural resource specialists and improvements in technology are anticipated to reduce these impacts.

Generally, management of priority wildlife habitat, priority watersheds, special status species management, and ACECs would protect and reduce the potential of damage to cultural resources by restricting certain uses depending on the number of acres identified or designated for management. Such management would continue under all alternatives.

In the past, livestock grazing has impacted cultural resources in areas where concentrated grazing has occurred. Concentrated grazing and trampling reduces vegetative cover and disturbs the soil, accelerating erosion and weathering. Cultural resources have been directly impacted by the modification, displacement and loss of artifacts, features, and middens, resulting in loss of valuable cultural resource information regarding site function, date of use, subsistence and past environments.

Grazing pressure on rangelands from livestock and wild horses and burros is anticipated to continue, if not increase. There is interest in acquiring grazing permits as they become available. In addition, due to proximity to expanding urban areas, some allotments may lose grazing acreage. This would ensure demand for areas that will remain available for grazing. Impacts on cultural resources from wild horse and burro grazing are similar to those that occur from livestock grazing, however all of the alternatives would work to manage wild horse and burro populations to stay within AMLs. Areas experiencing concentrated wild horse and burro grazing have been prioritized for gathering of wild horses and burros, if above the upper limit AML, in order to maintain a thriving natural ecological balance. However, due to various constraints, gathers are not conducted as frequently as needed to continue to maintain a thriving ecological balance. This trend is expected to continue, and be exacerbated by the current drought. Implementation of livestock grazing and wild horse and burro management in order to achieve land health standards would result in fewer areas of concentrated grazing and associated impacts on cultural resource sites.

Increasing mineral, lands and realty, and renewable energy actions would increase potential for indirect impacts on cultural resources from changes in setting, increased access to sites, and looting. Minerals, renewable energy and lands and realty activities may also result in direct disturbance and destruction of unknown cultural resources from the construction of roads, drill pads, power lines and facilities.

Mineral exploration and development is expected to continue to occur for locatable minerals, fluid mineral leasing, non-energy mineral leasing, and mineral material disposables. There are approximately 23 plans of operations for exploration (greater than 5 acres) or mining currently administered within the planning area, 260 contracts for free-use permits for salable mineral operations, and 148 geothermal leases currently leased (BLM 2013f). Additionally, the National Renewable Energy Laboratory data shows that portions of the planning

area have high potential for solar energy, and Luning Solar was issued a ROW grant for a 575-acre project in July, 2010.

Demands for land use authorizations in the planning area are anticipated to increase in correlation with future residential and commercial development in response to increasing population and energy demands. In response, the Designation of Energy Corridors on Federal Lands in the 11 Western States Programmatic EIS was published in 2007. Over the past 10 years the CCD has average issuance of approximately 28 ROW authorizations per year, with an average of 35 applied for annually.

Although, most impacts on cultural resources from minerals, lands and realty, and renewable energy have been avoided or mitigated through implementation of Section 106, indirect impacts from increased access to cultural sites, looting and changes in setting have sometimes occurred, and are expected to continue to occur. Recreational looting and excavation of cultural resource sites have damaged and destroyed cultural resources sites. Although these impacts continue, monitor and patrol by law enforcement and heritage education outreach efforts have helped to reduce these impacts.

Recreation activities have impacted cultural resources where concentrated recreational use has occurred or in areas popular for OHV uses. Unrestricted OHV travel has damaged cultural resources through cross-country travel and creating new roads or trails increasing access to cultural resource sites. Impacts are difficult to quantify due to dispersed use. Areas of higher OHV use experience increased vegetation community impacts, increasing potential for accelerated erosion of soils, which may result in damage or exposure of cultural resource sites. Population increases within the urban interface will escalate demands for access to public lands near residential developments, which will require increased management and protection of resources. The potential for impacts on cultural resources from direct disturbance, erosion, impacts on setting, increased access to sites and vandalism would increase as population and dispersed recreational use increase. Recreation management with respect to OHV travel includes limiting use. This would protect cultural resources depending on the number of acres designated as open, limited, or closed.

4.3.10 Paleontological Resources

This section presents potential impacts of the alternatives on paleontological resources. Existing conditions concerning paleontological resources are described in **Section 3.2.10, Paleontological Resources**. Paleontological resources are a fragile and nonrenewable scientific record that includes any fossilized remains, traces, or imprints of organisms preserved in or on the earth's crust that are of scientific interest and that provide information about the history of life on earth.

Summary

Paleontological resources are known to occur throughout the planning area as a result of a district-wide paleontological inventory that was completed in 1981 (Firby 1981). The planning area has not been systematically surveyed in accordance with the 2007 Instruction Manual 2008-009 that would classify the planning area based on the Potential Fossil Yield Classification (PFYC) system. Based upon the 1981 inventory, 331 locations were identified comprising 225 vertebrates, 73 invertebrates, and 33 paleoflora fossils ranging from the Triassic (approximately 230 million years before present) to the Quaternary (1.5 million years before present) (Firby 1981). Currently there are 3 paleontological areas identified for management. These include the Stewart Valley Fossil Site, the Pine Nut Range Hemphillian/Early Blancan interface, and the Ruhenstroth Paleontological Area.

The BLM policy is to manage paleontological resources for scientific, educational, and recreational values and to protect or mitigate these resources from adverse impacts. The BLM's four objectives for the management of fossil resources on BLM-administered lands are: 1) locating, evaluating, managing, and protecting fossil resources; 2) facilitating appropriate scientific, educational, and recreational uses of fossils; 3) ensuring that proposed land uses do not inadvertently damage or destroy important fossil resources; and 4) fostering public awareness of the Nation's rich paleontological heritage (BLM 1998a; BLM 1998b).

Overall, objectives and actions associated with other resources that result in closure to surface disturbance activities would result in beneficial impacts (less chance of disturbance) to any paleontological resources that might be present. Management for the following resources would not result in an effect on paleontological resources: air quality, climate, soil and water resources, vegetation, fish and wildlife, special status species, wild horses and burros, cultural resources, visual resources management, forestry and woodland product management, recreation and visitor management, renewable energy management, ACECs, Back Country Byways, National Trails, WSRs, BCWCAs, and WSAs.

Methods of Analysis*Methods and Assumptions*

Paleontological resources baseline information in **Section 3.2.10, Paleontological Resources**, was reviewed for current understanding of known resources and to determine the condition of the resources. Also, all laws and BLM policy pertinent to determining effects on paleontological resources (e.g., BLM Manual Section 8270 and Handbook H-8270-I, General Procedural Guidance for Paleontological Resource Management) were considered and included in criteria for determining impacts. This known information was overlain with the actions found under each alternative in Chapter 2, and

conclusions were drawn based on an understanding of how these types of actions may affect known and potentially discoverable resources.

This analysis assumes the following:

- Potential for impacts on both surface and subsurface paleontological resources is directly proportional to the amount of surface disturbance associated with the proposed action.

At the programmatic level of analysis, it is not possible to identify and evaluate areas of higher paleontological sensitivity (outside of the 3 identified management areas for paleontological resources) with respect to locations of proposed surface disturbance. Therefore, potential impacts on paleontological resources under each alternative can only be generally estimated, and they correlate directly to the amount of anticipated surface disturbance proposed under each alternative.

Indicators

Paleontological resource impacts primarily concern the potential destruction of nonrenewable fossil resources and the loss of scientific information associated with these resources, and includes destruction as the result of surface disturbance and the unlawful or unauthorized collection of fossil remains. Criteria for determining significant impacts on paleontological resources include:

- Loss of any fossil that could yield important scientific information or that embodies the distinctive characteristics of a type of organism, environment, period of time, or geographic region.

More generally, potential impacts on paleontological resources could occur if reasonable foreseeable future actions were to:

- Conflict with paleontological resource management objectives and guidelines established by the BLM; or
- Disturb paleontologically sensitive geologic formations.

Nature and Type of Effects

Paleontological resources can be impacted through natural weathering, erosion, ground disturbing activities, improper or over-collection, and vandalism, which can remove or damage those characteristics that make a paleontological resource scientifically important. Specific indicators used to assess the condition of *in situ* paleontological resources are the extent of erosion, rock fall, other natural processes, and human-caused disturbances. Exposed fossils can be damaged by wind and water erosion, and this damage can be exacerbated by concentration of human use and activity.

Types of impacts include permanent loss of paleontological resources and the scientific data it could provide through damage or destruction caused by surface

disturbing activities. The potential for undiscovered paleontological resources exists despite previous paleontological surveys and investigations. Without removing some rock surrounding fossils, they would remain largely undetected. Surface disturbing activities could directly negatively impact undiscovered paleontological resources by exposing the resources, which may result in inadvertent fossil damage or destruction. Conversely, ground disturbances monitored by qualified paleontologists could cause positive direct impacts on the paleontological resource database by discovering and recovering scientifically significant fossils. Indirect impacts could result from the increased human presence, leading to possible illicit collecting of newly exposed materials.

Effects on paleontological resources can typically be mitigated to below a level of significance by implementing paleontological mitigation identified in the BMPs or stipulations, such as monitoring during construction, excavating materials, or avoiding surface exposures. If data recovery were the prescribed mitigation, this could also result in fossils being salvaged that may never have been unearthed as the result of natural processes. These newly exposed fossils would become available for scientific research, education, display, and preservation into perpetuity at a public museum. Unmitigated surface-disturbing activities could dislodge, damage, or destroy paleontological resources and features that were not visible before surface disturbance.

An increase in visitors to, workers in, or access to paleontological localities or sensitive areas could result in an increased potential for loss of paleontological resources by vandalism and poaching. These impacts are difficult to mitigate to below the level of significance, but they can be greatly reduced by increasing public awareness about the scientific importance of paleontological resources through education, community partnerships, and interpretive displays, and by informing the public about penalties for unlawfully destroying or poaching these resources from BLM-administered lands.

Paleontology: Effects from Special Status Species Management

Effects Common to All Alternatives

If unknown paleontological resources were present within the boundaries of areas protected from surface disturbances due to special status species management, resources would also be protected. If not, there likely would be no impacts on paleontological resources resulting from special status species management objectives or actions under any of the alternatives. With respect to effects on paleontological resources, all of the alternatives are essentially equivalent.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Paleontology: Effects from Wildland Fire Ecology and Management

Effects Common to All Alternatives

Allowing conditional fire suppression management for a benefit and fire suppression can involve ground-disturbing activities at depths that can directly affect any undiscovered paleontological resources, if present. These actions include constructing fire lines, bulldozing access roads, and using heavy equipment. High severity fire can also burn packrat middens, damage surface fossils, including cracking, spalling, and oxidizing. Fire can result in impacts through erosion and the increased visibility of paleontological resources. Fire can also remove vegetation and expose previously undiscovered resources, allowing for their discovery, study and protection; however, locations exposed by fire can be susceptible to damage by subsequent erosion, vandalism, and unauthorized collecting.

Impacts on undiscovered paleontological resources cannot be assessed because the type, quality, and location of the resources are unknown. Given that the location of any surface-disturbing activities cannot be predicted, the intersection of the undiscovered resources and the potential future activities also cannot be predicted. There likely would be no impacts on known paleontological resources locations resulting from wildland fire management objectives or actions under any of the alternatives. With respect to effects on known paleontological resources, all of the alternatives are essentially equivalent.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Paleontology: Effects from Paleontological Resources Management

Effects Common to All Alternatives

Permits would be required to remove fossils for scientific purposes. As appropriate, physical conservation measures, such as signing, fencing, erosion control, and administrative conservation would be implemented to reduce impacts on the resources. In addition, law enforcement would patrol selected areas to help prevent damage to or theft of paleontological resources.

Education opportunities would be promoted and partnerships with academic and scientific organizations would be pursued. Materials would be published to promote public awareness and appreciation of the CCD paleontological resources. Scientific research information concerning the locations of specific resources would be published only if increased visitation would not harm the resource.

Under all alternatives, the BLM would manage paleontological resources for preservation, protection, and scientific, educational, and recreational use, such as public hobby collection of paleontological resources without reducing the significance or interest of the resource. Additionally the BLM would ensure that authorized land uses do not inadvertently damage or destroy important paleontological resources on BLM-administered land.

Effects under Alternative A

Management of paleontological resources under Alternative A would be the same as described under effects common to all. Additionally, Alternative A would continue to manage the 15,900 acre Stewart Valley Paleontological ACEC for paleontological resources.

Effects under Alternative B

Alternative B would classify the CCD landscape by potential fossil yield classification (PFYC) Class: very low, low, moderate, high, and very high potential to contain vertebrate fossils or noteworthy invertebrate or plant fossils. An on-the-ground survey prior to approval of surface-disturbing activities and/or monitoring by a qualified paleontologist during surface-disturbing activities would be required for all activities authorized within PFYC Class 4 and 5 formations.

Alternative B would establish 2 ACECs for the management of paleontological resources. These are the Stewart Valley Paleontological ACEC (15,900 acres) and the Ruhenstroth Paleontological ACEC (2,300 acres).

Due to inventorying for paleontological resources and designating an additional ACEC to protect paleontological resources, Alternative B would be more protective of paleontological resources than Alternative A.

Effects under Alternative C

Alternative C would classify the CCD landscape by PFYC. An on-the-ground survey prior to approval of surface-disturbing activities and/or monitoring by a qualified paleontologist during surface-disturbing activities would be required for all activities authorized within PFYC Class 4 and 5 formations. Additionally, under Alternative C, if paleontological resources are identified, surface disturbing activities would be avoided.

Like Alternative B, Alternative C would establish 2 ACECs for the management of paleontological resources. These are the Stewart Valley Paleontological ACEC (15,900 acres) and the Ruhenstroth Paleontological ACEC (2,300).

Effects under Alternative D

Alternative D would classify the CCD landscape PFYC. Inventorying and /or monitoring for paleontological resources under Alternative D would be the same as under Alternative B.

Alternative D would establish the Ruhenstroth Paleontological ACEC for the management of paleontological resources. Unlike the other Alternatives, Alternative D would not manage the Stewart Valley Paleontological area as an ACEC.

Effects under Alternative E

Alternative E would classify the CCD landscape by PFYC. An on-the-ground survey prior to approval of surface-disturbing activities and/or monitoring by a qualified paleontologist during surface-disturbing activities would be required for all activities authorized within PFYC Class 4 and 5 formations.

Like Alternative B and C, Alternative E would establish the Stewart Valley Paleontological ACEC and the Ruhenstroth Paleontological ACEC to protect paleontological resources.

Alternative E would include protective measures similar to Alternative C. However, if paleontological resources were discovered during site inventory before the implementation of a project, Alternative C would recommend avoidance of paleontological resources whereas Alternative E would recommend mitigation measures, which may be slightly less protective.

Paleontology: Effects from Caves and Cave Resources Management*Effects Common to All Alternatives*

Caves frequently contain pack rat middens, which are an important source of paleoenvironmental information. Identification and protection measures for caves and cave resources may also lead to the identification and protection of paleontological resources. Scientific study of these resources may provide additional information on pre-historic environments and other research questions relevant to the paleontological resources of the CCD

Effects under Alternative A

Alternative A would continue to manage caves and their associated cultural and paleontological features based on current land use plan decisions, policy, and regulations which are complementary to paleontological resource management goals.

Effects under Alternative B

The BLM would develop a public outreach program to foster an appreciation for caves and their resources, and would provide staff to monitor caves identified as culturally significant and heavily used by the public. This includes the Grimes Point Archaeological District, Hidden Cave, and Dynamite Cave. Implementation of public awareness of significant caves and their resources and added security could reduce the likelihood of theft and vandalism of the resources associated with well-known caves, but could encourage visitation to lesser known caves and resultant theft or vandalism of paleontological resources associated with them.

Alternative B would reduce the potential for impacts on paleontological resources associated with development around Dynamite Cave by implementing a 0.25-mile ROW avoidance area around the cave, closing the area to mineral material disposal, and applying for a 500-foot CSU stipulation for fluid mineral leasing. This would reduce the potential for disturbance to the paleontological resources associated with Dynamite cave from ROW, mineral material, and fluid mineral development.

Alternative B would reduce the potential for impacts on paleontological resources within Hidden Cave by implementing a ROW avoidance area within 500 feet of the cave, closing the area to mineral material disposal, and applying CSU stipulations within 500 feet of the cave for fluid mineral leasing. This would reduce the potential for disturbance to paleontological resources associated with Hidden Cave from ROW, mineral material, and fluid mineral development.

Due to these additional measures, management of caves and cave resources under Alternative B would be more protective of paleontological resources than Alternative A.

Effects under Alternative C

The BLM would develop public an outreach program to foster an appreciation for caves and their paleontological resources, and would provide staff to monitor caves identified as culturally significant and heavily used by the public. This includes the Grimes Point Archaeological District, Hidden Cave, and Dynamite Cave. Implementation of public awareness of significant caves and added security around significant caves would reduce the likelihood of theft vandalism of the paleontological resources associated with the caves. However, education on cave resources could encourage visitation to lesser known caves with resultant theft or vandalism of paleontological resources associated with them.

The BLM would also include significant caves on the fuels-treatment program to reduce risk of fire and increase protections of paleontological resources that may be impacted by a high-fuels load.

Management under Alternative C would reduce the potential for impacts on paleontological resources associated with Dynamite Cave by implementing a 0.5-mile ROW exclusion area around the cave, closing the area to mineral material disposal and fluid mineral leasing, recommending the area for withdrawal from locatable mineral entry, and closing the area to motorized travel within 500 feet of the cave.

Alternative C would prevent impacts on paleontological resources associated with Hidden Cave by implementing a ROW exclusion area within 500 feet of the cave, closing the area to fluid mineral leasing and mineral material disposal, recommending the area for withdraw from locatable mineral entry, and closing the area to motorized travel within 500 feet of the cave.

Alternative C is similar to Alternatives B and D, but with greater restrictions in respect to ROW exclusion, mineral closures, travel management designations, and fuels-treatments. Alternative C would be more protective of the paleontological resources associated with caves and cave resources than the other Alternatives.

Effects under Alternative D

Alternative D would protect paleontological resources associated with caves from vandalism or theft by installing gates, security fencing and signs. Like Alternative C, Alternative D includes culturally significant caves in the fuels-treatment program to protect sensitive attributes that may be impacted by a high-fuels load. Alternative D would also develop public outreach programs to foster an appreciation for caves and their paleontological resources, and provide staff to monitor caves identified as culturally significant and heavily used by the public.

Specific management of Hidden Cave and Dynamite Cave under Alternative D would have the same effects on paleontological resources as Alternative B. These measures would be more protective of paleontological resources associated with caves than Alternative A.

Effects under Alternative E

The BLM would develop public outreach programs to foster an appreciation for caves and their paleontological resources, and provide staff to monitor caves identified as culturally significant and heavily used by the public. This includes the Grimes Point Archaeological District, Hidden Cave, and Dynamite Cave. Implementation of public awareness of significant caves and added security around significant caves would reduce the likelihood of theft and vandalism of paleontological resources associated with the caves, but could encourage

visitation to lesser known caves and resultant theft or vandalism of paleontological resources associated with them.

The BLM would also include significant caves on the fuels-treatment program to reduce risk of fire and increase protections on sensitive paleontological resources that may be impacted by a high-fuels load.

Alternative E would reduce the potential for impacts on paleontological resources associated with Dynamite Cave by implementing a 0.25-mile buffer of ROW avoidance area around the cave, closing the area to mineral materials disposal, and applying a 500-foot CSU stipulation for fluid mineral leasing. This would reduce the potential for disturbance to paleontological resources associated with development around Dynamite Cave.

Management of Hidden Cave under Alternative E would be the same as management of the Cave under Alternative B.

Alternative E would prevent impacts on paleontological resources associated with Hidden Cave by implementing a ROW exclusion area within 500 feet of the cave, closing the area to fluid mineral leasing and mineral material disposal, recommending the area for withdraw from locatable mineral entry, and closing the area to motorized travel within 500 feet of the cave.

Management of Dynamite Cave under Alternative E would be the same as management of the cave under Alternative C.

Management of caves and cave resources would be more protective of associated paleontological resources under Alternative E than Alternative A.

Paleontology: Effects from Livestock Grazing Management

Effects Common to All Alternatives

The areas around springs can be either erosional or depositional. Where there are seasonal deposits of sediments around springs, these deposits can contain pollen or other paleoenvironmental materials. Disruption of these seasonal depositions impacts the scientific value of these materials.

Grazing animals tend to congregate in riparian areas including springs. Potential impacts of grazing include increased sediment loading from soil eroded by wind and water due to vegetation loss, direct soil disturbance, and runoff concentrated into animal trails, with consequent enhanced erosion. Spring developments and livestock and wild horse and burro concentrations in the vicinity of springs could affect any deposition in the area of springs, so potential deposition of paleoenvironmental materials could also be affected reducing the scientific value of these materials.

Livestock and wild horse and burro grazing under all of the alternatives is expected to continue to have impacts on springs and associated paleoenvironmental deposits.

Effects under Alternative A

Under Alternative A, 6,700 acres would not be available for livestock grazing. This is the least amount among the alternatives and effects from livestock grazing could occur over the largest area.

Effects under Alternative B

Under Alternative B, the BLM would manage 6,100 acres as not available for livestock grazing. This would decrease grazing associated impacts compared to Alternative A.

Effects under Alternative C

Under Alternative C, 2,702,000 acres would not be available for livestock grazing. This alternative would substantially reduce impacts from grazing compared to Alternative A.

Effects under Alternative D

Alternative D would manage 10,700 acres as not available for livestock grazing, which would reduce impacts from grazing compared to Alternative A.

Effects under Alternative E

Alternative E would cause the same impacts as Alternative B.

Paleontology: Effects from Geology and Mineral Management

Effects Common to All Alternatives

If present, paleontological resources could be impacted by the extent and depths of ground disturbance associated with salable and locatable mineral development. However, the potential for paleontological resources would be assessed before these activities were authorized, and avoidance or mitigations would be required.

Under All Alternatives 194,900 acres would be managed as closed to locatable mineral entry. This would prevent potential impacts on paleontological resources from ground disturbing activities related to locatable mineral exploration and development in the closed areas.

Effects under Alternative A

Under Alternative A, 56,900 acres would be managed as closed to all mineral entry, exploration, and development, and energy development under the Classification and Multiple Use Act, the Walker Planning Area, the Carson City Urban Interface Plan, and under existing withdrawals and segregation from mineral entry that would be maintained.

Locatable Minerals

Alternative A would recommend an additional 3,700 acres for withdrawal from locatable mineral entry. This would indirectly protect paleontological resources from impacts of locatable mineral exploration and development in these areas. Acres withdrawn from locatable mineral entry under Alternative A would be greater than Alternative D, but less than Alternatives B, C, or E.

Fluid Minerals

Alternative A would continue to manage 839,100 acres as closed to oil and gas and geothermal leasing. The BLM would apply NSO stipulations for oil and gas leasing to 700 additional acres, including areas within 300 to 500 feet of water resources.

This is a total of 839,800 acres of restrictions for fluid mineral leasing that would inadvertently protect potential paleontological resources within these areas, which is the fewest acres with fluid mineral leasing restrictions of all the alternatives.

Mineral Materials (Salable)

Alternative A would manage 564,200 acres as closed to mineral material disposal. Closures to mineral material disposal under Alternative A would be greater than Alternative B, but less than Alternatives C, D, and E.

Nonenergy Leasable Minerals:

Alternative A would close 738,800 acres to nonenergy leasable minerals, which is less than Alternatives C, D, and E, and the same as B.

Effects under Alternative B

Locatable Minerals

Alternative B would recommend 439,600 acres for withdrawal from locatable mineral entry. This is substantially greater than Alternative A.

Fluid Minerals

Alternative B would manage 786,500 acres as closed to oil and gas and geothermal leasing. An additional 404,600 acres would be managed with NSO stipulations for fluid mineral leasing. The BLM would apply CSU stipulations on 2,120,200 acres, including within 500 feet of lentic and lotic habitats.

This is a total of 3,311,300 acres of restrictions for fluid mineral leasing that would inadvertently protect potential paleontological resources within these areas, which is more than Alternative A.

Mineral Materials (Salable)

Alternative B would manage 807,200 acres as closed to mineral material disposal. Alternative B would restrict mineral material disposal within PPMA and PGMA if it is determined that there would be adverse impacts on Greater Sage-Grouse

or their habitat. This could result in restrictions for mineral material development on 414,200 acres.

Assuming that PPMA and PGMA remain open or that mineral material disposal could be mitigated to not adversely affect Greater Sage-Grouse habitat, Alternative B would manage the fewest acres with restriction on mineral material development of the alternatives.

Nonenergy Leasable Minerals

Alternative B would manage 981,900 acres would be managed as closed to nonenergy leasable minerals. Alternative B would restrict nonenergy leasable mineral development within PPMA and PGMA if it is determined that there would be adverse impacts on Greater Sage-Grouse or their habitat.

Assuming that PPMA and PGMA remain open or that nonenergy leasable mineral development could be mitigated to not adversely affect Greater Sage-Grouse habitat, Alternative B provides for the same amount of acres of closure to nonenergy leasable minerals than Alternative A.

Effects under Alternative C

Locatable Minerals

Under Alternative C, 117,500 acres would be recommended for withdrawal from locatable mineral entry, which is greater than Alternative A.

Fluid Minerals

Alternative C would manage 2,081,700 acres as closed to oil and gas and geothermal leasing. The BLM would apply NSO stipulations for fluid mineral leasing on an additional 1,039,200 acres and CSU stipulations on an additional 1,242,800 acres.

This is a total of 4,363,700 acres of restrictions for fluid mineral leasing that would inadvertently protect potential paleontological resources within these areas, which is the most amount of closure of all the alternatives.

Mineral Materials (Salable)

Under Alternative C, the BLM would manage 3,004,800 acres as closed to mineral material disposal. This includes caves and cave resources and areas within 200 feet of riparian/wetland areas.

Alternative C would close more acres to mineral materials than any of the other Alternatives.

Nonenergy Leasable Minerals:

Alternative C would close 2,960,800 acres to nonenergy mineral leasing. Alternative C would manage more acres as closed to nonenergy leasable minerals than any of the other alternatives.

Effects under Alternative D

Locatable Minerals

Under Alternative D 440,800 acres would be recommended for withdrawal from locatable mineral entry, which is substantially greater than Alternative A.

Fluid Minerals

Alternative D would manage 737,000 acres as closed to oil and gas and geothermal leasing. The BLM would apply NSO stipulations for fluid mineral leasing an additional 864,800 acres. The BLM would also apply CSU stipulations to 2,071,400 acres including areas within 200 feet of riparian/wetland areas and within 500 feet of lentic and lotic habitat.

This is a total of 3,673,200 acres of restrictions for fluid mineral leasing that would inadvertently protect potential paleontological resources within these areas, which is more than Alternative A.

Mineral Materials (Salable)

Alternative D would manage 807,700 acres as closed to mineral material sales. Alternative D would restrict nonenergy mineral material disposal within Grater Sage-Grouse PPMA and PGMA if it is determined that there would be adverse impacts on Greater-Sage Grouse or their habitat. This could result in restrictions for mineral material development on 414,200 acres.

Assuming that PPMA and PGMA remain open or that mineral material disposal could be mitigated to not adversely affect Greater Sage-Grouse habitat, Alternative D would manage more acres as closed to mineral material sales than Alternative A.

Nonenergy Leasable Minerals:

Alternative D would close 981,900 acres to nonenergy leasable minerals. Alternative D would restrict nonenergy leasable mineral development within PPMA and PGMA if it is determined that there would be adverse impacts on Greater Sage-Grouse or their habitat.

Assuming that PPMA and PGMA remain open or that mineral material disposal could be mitigated to not adversely affect Greater Sage-Grouse habitat, Alternative D would manage more acres as closed to mineral material sales than Alternative A.

Effects under Alternative E

Locatable Minerals

Under Alternative E, 470,600 acres would be recommended for withdrawal from locatable mineral entry. This would be the largest amount of acres recommended for withdrawal under any of the alternatives.

Fluid Minerals

Alternative E would manage 1,007,200 acres as closed to oil and gas and geothermal leasing. The BLM would apply NSO stipulations on an additional 1,151,600 acres with, including lands within 500 feet of riparian/wetland areas and lentic and lotic habitats, Alternative E would also manage an additional 1,844,900 acres with CSU stipulations.

This is a total of 4,003,700 acres of restrictions for fluid mineral leasing that would inadvertently protect potential paleontological resources within these areas, which is more than Alternative A.

Mineral Materials (Salable)

Alternative E would manage 1,778,700 acres as closed to mineral material disposal. Alternative E would close more acreage to mineral materials than Alternative A.

Nonenergy Leasable Minerals:

Alternative E would manage 1,785,900 acres as closed to nonenergy leasable minerals. Alternative E would close more acres to nonenergy leasable minerals than Alternative A.

Paleontology: Effects from Comprehensive Travel and Transportation Management

Effects Common to All Alternatives

Increased transportation or access to any area would increase the level of visitation, resulting in greater potential for impact on any paleontological resources that might be present. Open OHV use can impact paleontological resources, through direct disturbance, breakage and displacement, vandalism, soil compaction, altered surface water drainage, and erosion. Motorized access could also increase the risk of impacts on resources from unauthorized collection or vandalism. Restricting vehicle use to existing routes would reduce the risk of disturbing paleontological resources located off travel routes, but impacts from access could still occur. Enforcing travel routes is difficult, and unauthorized user-created trails would continue to occur, potentially impacting paleontological resources. Closure of areas to OHV use provides the most protection for paleontological resources, if access for cultural purposes can be maintained.

There likely would be no specific impacts on known paleontological resources resulting from transportation and access management objectives or actions under any of the alternatives. With respect to effects on known paleontological resources, all of the alternatives are essentially equivalent.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Paleontology: Effects from Lands and Realty

Effects Common to All Alternatives

Paleontological resources would be one of the public resources evaluated when acquisition actions are considered. The acquisition of new land would provide long-term federal protection of any paleontological resources contained therein.

Exchange or disposal of lands to nonfederal entities would permanently remove federal protections for paleontological resources. The reduced level of protection would result in greater potential for vandalism, theft, and destruction of any paleontological resources present. The potential for paleontological resources would be assessed before these activities were authorized.

No specific lands with known paleontological resources have been identified for acquisition or disposition, or so there likely would be no impacts on paleontological resources resulting from lands and realty management objectives or actions under any of the alternatives. With respect to effects on paleontological resources, all of the alternatives are essentially equivalent.

Construction of ROWs, leases, and permits for development projects could expose unidentified paleontological resources to erosion and affect the visual settings of historic sites.

Impacts on cultural resource from all lands and realty actions would be subject to further review. All ROWs would be subject to BMPs, standard operating procedures, IOPs, stipulations, restrictions, and mitigation measures, would be implemented to reduce potential impacts.

Effects under Alternative A

Alternative A would manage 564,100 acres as ROW exclusion, and would not manage any acres as ROW avoidance. Land Use Authorizations and management under Alternative A would provide the least protection for paleontological resources.

Effects under Alternative B

Alternative B would manage 580,000 acres as ROW exclusion and 1,195,800 acres as ROW avoidance, totaling 1,775,800 acres of land restriction that would provide protection of paleontological resources. This is more than Alternative A.

Effects under Alternative C

Alternative C would manage 2,675,800 acres as ROW exclusion and 369,300 acres as ROW avoidance totaling 3,045,100 acres of land restriction. This would best protect paleontological resources from potential impacts for lands and realty development.

Effects under Alternative D

Alternative D would manage 564,100 acres as ROW exclusion and 1,226,100 acres as ROW avoidance, totaling 1,790,200 acres of land use restriction that would protect paleontological resources. This is more than Alternative A.

Effects under Alternative E

Alternative E would manage 605,900 acres as ROW exclusion and 1,448,200 acres as ROW avoidance totaling 2,054,100 acres of land restrictions that would prevent impacts on paleontological resources. This is more than Alternative A.

Paleontology: Cumulative Effects

In the past there have been direct impacts on paleoenvironmental deposits at springs and in other riparian zones from range improvements as well as indirect impacts from concentrated grazing leading to erosion and disturbance of the paleoenvironmental record in these areas. Grazing pressure on rangelands from livestock is anticipated to continue, if not increase. There is interest in acquiring grazing permits as they become available. In addition, due to proximity to expanding urban areas, some allotments may lose grazing acreage. This would ensure demand for areas available for grazing. Current land use plans have employed management actions to reduce concentrated grazing and have improved conditions based on the standards for rangeland health. These actions have reduced impacts on paleoenvironmental resources from livestock grazing.

Minerals, lands and realty, renewable energy, and recreation activities have disturbed soils which may have damaged unknown resources. Increasing mineral, lands and realty, and renewable energy actions would increase potential for disturbing soils and consequently increasing the potential to damage, destroy, remove, or bury paleontological resources. Management actions to re-inventory the planning area for paleontological resource potential to assess possible resource impacts and mitigation needs for actions involving surface disturbance will reduced impacts on paleontological resources. Measures to avoid and reduce impacts on paleontological resources currently include consultation of the 1981 inventory data base, literature searches, inventory, and implementation of mitigation measures to avoid or reduce impacts.

Unrestricted OHV travel may have damaged surface paleontological resources through cross-country travel and through the creation of new roads or trails. Impacts are difficult to quantify due to dispersed use. Recreational looting and excavation of paleontological sites have removed vertebrate fossils. Although these impacts continue, monitor and patrol by law enforcement and heritage education outreach efforts have helped to reduce these impacts. Recreation management of OHV travel includes limiting use. This would protect paleontological resources depending on the number of acres designated as open, limited, or closed by alternative.

4.3.11 Visual Resources

This section discusses impacts on visual resources from proposed management actions for resources and resource uses. Existing conditions are described in **Section 3.2.11, Visual Resources**.

Summary

Impacts on visual resources would result from management actions associated with the following: climate management, vegetation resources, wildland fire ecology and management, visual resources management, livestock grazing management, geology and mineral management, recreation and visitor services, Comprehensive Travel and Transportation Management, lands and realty, renewable energy (wind and solar), areas of critical environmental concern, and WSRs. The management actions typically involve changes to activities (such as vegetation treatments) and surface disturbances (such as wildfire suppression, recreation, and livestock grazing). They also involve changes in land use designations (such as ROW avoidance and exclusion areas).

Alternative A would continue to rely on dated plans and documents to manage visual resources. This threatens visual resources, because 3,494,900 acres lacks VRM Class objectives for managing visual resources. Ongoing impacts on visual resources would be the greatest under this alternative due to a lack VRM Class objectives, the number of acres open to motorized and mechanized travel, the lack of fluid mineral stipulations, the lack of ROW avoidance areas, the lack of avoidance areas for wind energy development, the number of acres of ACECs, and the lack of ERMA to manage recreation in appropriate locations.

Alternative C provides the most management actions for protecting visual resources, such as through VRM Class I and II designations, ROW exclusion areas, ACECs, and WSRs. Overall, Alternatives B and D contain the fewest management actions for protecting visual resources due to, for example, the amount of land that is open to mineral development. Depending on the resource, Alternative E is typically more or less protective of visual resources than Alternatives B and D.

Methods of Analysis

The visual resource inventory (VRI) classes form the basis for analysis in this section. Although VRI classes use the same numerical scale (i.e., Class I through

IV) as VRM classes, they are defined differently. Visual resource inventory classes are the categories the BLM uses to classify the current and combined visual factors (scenic quality, sensitivity, and distance zone) of the landscape and is how the BLM communicates the degree of visual value in the area. Generally, VRI Class II indicates high visual value; VRI Class IV indicates lower visual value based on the inventory factors, while VRI Class I represent high visual value based on previous Congressional and administrative decisions to manage the landscape character for preservation that will not be revisited under the RMP revision. For more information on the VRI process, refer to BLM Handbook H-8410-1, Visual Resource Inventory (BLM 1986a). The VRI is on file at the CCD.

Impacts on visual resources are assessed by comparing the VRI class of an area to the VRM class for the same area and assessing the potential for change in the three components of VRI classification (scenic quality, sensitivity level, and distance zones). The management of resources and resource uses and how those actions might impact scenic resources is also examined. Applying VRM Class I objectives to any VRI classification would preserve the existing character of the landscape. In other words, the VRI classification would be expected to remain the same, so impacts would be negligible. Therefore, applying anything but VRM Class I objectives could result in some level of change if activities that would contrast with the landscape are permitted in the area. Any landscape managed as VRM Class IV would be subject to significant visual change regardless of VRI Class.

When assessing scenic quality, seven factors are considered: landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. Of these factors, decisions in the RMP have the highest potential to change vegetation, color, or cultural modifications. Where cultural modifications would be allowed, there could be a change in the variety of vegetation forms, patterns, or texture from such activities as construction, vegetation removal, soil composition changes. Furthermore, where cultural modifications would be allowed to the extent that the basic components of the landscape (e.g., vegetation, soil, and rock) changed drastically, the variety, contrast, and harmony of color could change as well. Under no alternative would the scenic quality be anticipated to significantly improve.

When assessing sensitivity, six factors are considered: type of users, amount of use, public interest, adjacent land uses, special areas, and other factors. Of these factors, decisions in the RMP have the highest potential to change types of users, amount of use, and special areas. The designated use of BLM-administered lands can influence the types of users and the amount of use. Also, the designated use of BLM-administered lands can result in creating special areas to preserve the natural landscape setting.

When assessing distance zones, landscapes are subdivided into three distance zones based on relative visibility from travel routes or observation points. The

three zones are: foreground-midleground zone (areas seen from highways, rivers, or other viewing locations which are less than 3 to 5 miles away), background zone (seen areas beyond the foreground-midleground zone but usually less than 15 miles away), and seldom seen zone (areas not seen as foreground-midleground or background, i.e., hidden from view). Decisions in the RMP are not likely to change these distance zones, unless access to an area is increased or decreased. This could, for example, change a seldom seen zone to a foreground-midleground zone or background zone.

Assumptions

The following assumptions were used to assess the impacts on visual resources:

- The scenic vistas within the planning area will become more sensitive to visual change; in other words, they will increase in value over the next 20 years.
- Scenic resources will become increasingly important to residents of and visitors to the area.
- Visitors to BLM-administered lands or residents living near BLM-administered lands are sensitive to changes in visual quality.
- Activities that cause the most contrast and are the most noticeable to the viewer and the public will be considered to have the greatest effect on scenic quality.
- The severity of a visual effect depends on a variety of factors, including the size of a project (i.e., area disturbed and physical size of structures), the location and design of roads and trails, and the overall visibility of disturbed areas.
- The more protection that is associated with the management of other resources and special designations, the greater the benefit to visual resources of the surrounding viewsheds.
- VRM class objectives apply to all resources. Class objectives will be adhered to through project design, avoidance, or mitigation.
- Visual resource design techniques and BMPs will be implemented to mitigate potentially harmful impacts.
- WSAs are and will continue to be managed according to BLM Manual 6330, Management of Wilderness Study Areas (BLM 2012e), which includes management as VRM Class I. Because activities within WSAs must meet the nonimpairment criterion, which generally restricts new surface-disturbance, it is assumed that a WSA will generally protect visual resources in those areas.
- The BLM will continue to protect and preserve Native American cultural and sacred sites and Native American access to these sites whenever possible. The BLM will take no action that would

adversely affect these areas or locations without first consulting with the appropriate Native American tribes (Executive Orders 13007 and 13084).

- Visual contrast ratings will be required for all projects. The visual contrast rating system will be used as a guide to analyze site-specific impacts from projects as well as project design and placement. Projects will be designed to minimize their visual impacts in order to conform to the area's VRM class objective. This will allow the BLM to reduce impacts on a site-specific basis to ensure compliance with the assigned VRM class.
- Areas without either VRI or VRM classes cannot be effectively managed for visual resources. Classes are identified for BLM-administered lands requiring comprehensive management of visual resources.

Indicators

The scenic quality of the planning area is of national significance and an important part of the local and state economy. Many people live and recreate in the planning area because of its remoteness and visual qualities. The visual setting is an important part of local lifestyles and, for most travelers, the scenery or visual resource is an important part of their visit. Both tourists and residents drive across this landscape expecting to see open mountain vistas, deep canyons, dramatic cliffs and mesas, and vast rolling sagebrush-covered lands.

The VRI involves identifying the visual resources of an area and assigning them to inventory classes using the BLM's resource inventory process. The process involves rating the visual appeal of a tract of land, measuring public concern for scenic quality, and determining whether the tract of land is visible from travel routes or observation points. The results of the VRI become an important component of the area's RMP because they establish how BLM-administered lands will be used and allocated for different purposes. It is developed through public participation and collaboration. Visual values are considered throughout the RMP process, and the area's visual resources are then assigned to the management classes with established objectives. The VRI classes do not establish management direction and are not used as a basis for constraining or limiting surface-disturbing activities, but they are considered a baseline for existing conditions.

The assignment of VRM classes is ultimately based on management decisions made during the RMP process, which must take into consideration the value of visual resources. During the process, inventory class boundaries can be adjusted as necessary to reflect these resource allocation decisions. The goal of VRM is to minimize the visual impacts of all surface-disturbing activities, regardless of the class to which an area is assigned. Current VRM classes are summarized in **Table 3-22, Visual Resource Management Classes**, and are displayed in **Figure**

2-13, Alternative A: Visual Resource Management Classes. Objectives of the four VRM classes are included in **Section 3.2.11**.

The indicator of impacts on visual resources is the following: A proposed VRM class would allow changes to the landscape that could alter its character enough that future visual resource inventories would result in a reclassification. For example, if an area currently managed for VRM Class IV has VRI Class II lands, then the level of change allowed by VRM Class IV could alter the landscape to the point that future visual resource inventories could result in reclassifying the area to VRI Class III or IV.

Nature and Type of Effects

Management of the following resources would have negligible or no effects on visual resources: air quality, soils and water, fish and wildlife, special status species, wild horse and burros, cultural resources, paleontological resources, caves and cave resources, forestry and woodland products, Back Country Byways, national trails, BCWCAs, WSAs, tribal interests, public health and safety, and interpretation and environmental education.

While there may be restrictions on surface-disturbing activities proposed to protect some of these resources, that discussion is included in a general analysis under the applicable resource program (e.g., impacts from restrictions on ROW location for all resources are discussed under the effects from lands and realty).

Impacts on visual resources would result from management actions associated with the following: climate management, vegetation resources, wildland fire ecology and management, visual resources management, livestock grazing management, geology and mineral management, recreation and visitor services, Comprehensive Travel and Transportation Management, lands and realty, renewable energy (wind and solar), areas of critical environmental concern, and WSRs.

Climate Management

Among other factors, temperature and water affect vegetation distribution and composition. Activities that alter the climate can result in changes to temperatures and the availability of water. As a result, changes in the distribution and composition of vegetation would occur. This would result in indirect impacts on the scenic quality of the vegetation landscape.

Vegetation Resources

Forest and woodlands management actions involve thinning and removing trees in pinyon-juniper areas could cause visual intrusions creating linear features within viewsheds that would impact the integrity of visual resources. The degree of impacts is dependent on the location of disturbance and the VRM class. Restoration and rehabilitation management actions involve restoring burned or WUI areas using appropriate vegetation would improve viewsheds impacted by wildfire over time. Invasive species and noxious weeds management actions involve controlling the

distribution and spread of invasive species and noxious weeds. These vegetation management actions involve using physical, mechanical, educational, biological, chemical, and fire treatments that alter the composition and distribution of vegetation or create desired vegetation mosaics. In the short term, these treatment methods can leave the ground surface scarred and void of vegetation, thereby changing the form and texture of vegetation across the landscape. It can also introduce new colors to the treated area by killing vegetation or removing vegetation and leaving the soil surface exposed. In the long term, once desired vegetation becomes established and matures, it can create a landscape with vegetation forms, colors, and textures that are appropriate to the local visual landscape. Appropriate vegetation would also minimize the spread of wildfires capable of diminishing the quality of scenic resources.

Wildland Fire Ecology and Management

Wildfire ecology and management actions involve a variety of wildfire suppression tactics in order to protect specific values. They also involve fuels treatments in order to control the ignition and spread of wildfires and develop robust vegetation communities.

Similar to vegetation resources, wildland fire ecology and management involves tactics and treatments that alter the composition and distribution of vegetation. For example, wildland fire ecology and management contains the same actions as described above under vegetation resources.

In the short term, these tactics and treatments can leave the ground surface scarred and void of vegetation, thereby changing the form and texture of vegetation across the landscape, as well as the landform in some instances. They can also introduce new colors to the area by removing vegetation and leaving the soil surface exposed. In the long term, once desired vegetation becomes established and matures, it can create a landscape with vegetation forms, colors, and textures that are appropriate to the local visual landscape. Appropriate vegetation would also minimize the spread of wildfires capable of diminishing the quality of scenic resources.

Visual Resources Management

Visual resource values would receive higher levels protection than what is the norm when a VRM class objective is more restrictive to land use practices than what is commensurate with the VRI class values. For example, a VRM Class II designation of VRI Class III land would protect visual resources from changes that could occur under a VRM Class III designation. Although the VRI Class III land lacks the visual resource attributes of VRI Class II lands, designating the land as VRM Class II ensures future changes to visual resources are more restrictive than if the land were assigned a commensurate VRM Class III designation. This form of management acknowledges that the existing character of the landscape should receive fewer changes in the future than it did in the past in circumstances where the current land use plan designated a VRM Class

that is commensurate with the VRI Class values. Conversely, visual resources would receive less protection where VRM classes are less restrictive than VRI classes. **Table 4-7**, Summary of VRI Class by VRM Class, identifies how VRM class designations would be applied to lands with and without VRI classes for each alternative.

Livestock Grazing Management

Livestock grazing may cause secondary effects on visual resources through trampling and compaction of soils, grazing of vegetation, and channel incision. Watering areas are especially prone to disturbance, where concentrated vegetation and soil damage can occur. Structures associated with livestock grazing management (e.g., fences, stock ponds, guzzlers, cattle guards, feeding troughs) could create visual intrusions. It is unlikely that these activities or structures would degrade the scenic quality of an area so as to change the VRI class. Modifications to grazing practices to improve land health needed as a result of overgrazing would also help restore the visual quality of the area.

Geology and Mineral Management

Geology and mineral management actions identify areas open and closed to mineral development activities. Mineral development would not occur in areas that are closed, thereby preventing activities from occurring that degrade visual resources. In open areas, mineral development may be subject to BMPs or stipulations that restrict the location and types of mineral development activities.

Stipulations for fluid mineral leasing and surface-disturbing activities (i.e., NSO, CSU, and TL) would mitigate impacts on visual quality from mineral actions. Applying NSO stipulations would provide direct protection for visual resources by preventing surface occupancy and use that could alter viewsheds, vegetation, color, adjacent scenery, and cultural modifications associated with the scenic quality of an area. CSU stipulations would protect visual resources to a lesser extent because surface-disturbing activities would only have to be modified or moved to a different location. In high quality visual areas, these stipulations would provide some protection against the reclassification of areas to a lower VRI Class in the future. In general, alternatives with more acres protected by stipulations would provide more protection to high quality visual areas.

Stipulations in areas open to mineral development control activities that degrade visual resources. Mineral development involves roads, pipelines and electrical lines, and facilities. As a result, mineral development in areas managed as open to mineral development without stipulations would cause a greater impact on visual resources.

New roads would add artificial elements to undeveloped areas. Improving roads typically enhances the contrast of the road with the adjacent landscape. Roads lack vegetation and create an abrupt vegetation edge along the roadside.

Table 4-7
Summary of VRI Class by VRM Class

VRM Class by Alternative	Total Acres	VRI Class (Acreage and Percent)									
		VRI Class I		VRI Class II		VRI Class III		VRI Class IV		No VRI Class	
		0	%	509,649	%	1,460,409	%	2,829,322	%	4,259	%
Alternative A											
VRM Class I	564,100	0	0.0%	80,300	16%	299,400	21%	184,300	7%	0	0%
VRM Class II	38,300	0	0.0%	26,500	5%	11,500	1%	400	0%	0	0%
VRM Class III	320,600	0	0.0%	126,600	25%	147,500	10%	46,400	2%	232	5%
VRM Class IV	385,700	0	0.0%	56,700	11%	137,100	9%	192,000	7%	8	0%
Undesignated	3,494,900	0	0.0%	219,900	43%	864,600	59%	2,404,700	85%	3,700	94%
Alternative B											
VRM Class I	564,100	0	0.0%	80,300	16%	299,400	21%	184,300	7%	0	0%
VRM Class II	56,800	0	0.0%	7,500	1%	12,400	1%	36,800	1%	53	1%
VRM Class III	1,379,400	0	0.0%	112,800	22%	331,700	23%	934,600	33%	1	0%
VRM Class IV	2,803,000	0	0.0%	309,000	61%	816,400	56%	1,672,100	59%	3,900	99%
Alternative C											
VRM Class I	981,900	0	0.0%	81,800	16%	299,400	21%	184,300	7%	0	0%
VRM Class II	733,900	0	0.0%	158,100	31%	379,500	26%	338,200	12%	894	21%
VRM Class III	213,400	0	0.0%	49,200	10%	91,100	6%	278,700	10%	35	1%
VRM Class IV	2,874,100	0	0.0%	220,400	43%	690,000	47%	2,026,500	72%	3,000	78%
Alternative D											
VRM Class I	564,100	0	0.0%	80,300	16%	299,400	21%	184,300	7%	0	0%
VRM Class II	66,400	0	0.0%	16,000	3%	28,300	2%	21,900	1%	53	1%
VRM Class III	185,900	0	0.0%	44,900	9%	92,400	6%	48,400	2%	0	0%
VRM Class IV	3,986,900	0	0.0%	368,400	72%	1,039,900	71%	2,573,100	91%	3,900	99%
Alternative E											
VRM Class I	564,100	0	0.0%	80,300	16%	299,400	21%	184,300	7%	0	0%
VRM Class II	513,600	0	0.0%	25,300	5%	53,300	4%	109,000	4%	270	6%

Table 4-7
Summary of VRI Class by VRM Class

VRM Class by Alternative	Total Acres	VRI Class (Acreage and Percent)									
		VRI Class I		VRI Class II		VRI Class III		VRI Class IV		No VRI Class	
		0	%	509,649	%	1,460,409	%	2,829,322	%	4,259	%
VRM Class III	1,383,900	0	0.0%	133,200	26%	444,500	30%	1,016,200	36%	1	0%
VRM Class IV	2,341,700	0	0.0%	270,800	53%	662,700	45%	1,518,200	54%	3,700	93%

Source: BLM GIS 2014a, BLM GIS 2014b

Smooth roads would stand out against the moderately coarse texture of the terrain. This would affect visual resources by dividing the landscape with areas that lack vegetation, altering the natural topography, and altering the texture and color of the land surface. The visibility of the new and improved roads would vary, depending on viewer distance and location, topography, and screening vegetation.

New pipelines and electrical lines would add artificial elements to undeveloped areas. The form, line, and texture of these structures would not resemble nearby structures, unless they are co-located with similar existing structures. In particular, pipelines would divide the landscape with strips of land lacking vegetation and electrical lines would introduce prominent vertical elements. The visibility of the new pipelines and electrical lines would vary, depending on viewer distance and location, topography, color and composition of pipelines and electrical line poles, and screening vegetation.

Facilities, such as power plants, wells and pits, would add artificial elements to undeveloped areas. These areas would be cleared of vegetation, thereby leaving a clearing that contrasts with the surrounding landscape. The form, line, color, and texture of these facilities would not resemble nearby structures, unless they are co-located with similar existing industrial facilities. Also, the facilities would be sources of activity and commotion that are not typically found in undeveloped areas. The visibility of the facilities would vary, depending on viewer distance and location, topography, color and composition of facilities, and screening vegetation.

Lights would be installed for safety and to illuminate work areas at night. This would reduce nighttime darkness by adding light to areas lacking sources of artificial light. As a result, this would diminish opportunities for viewing visual resources between dusk and dawn. In particular, this would affect stargazing opportunities.

Table 4-8, Acres Open to Fluid Mineral Leasing by VRI Category, displays those lands that are open to fluid mineral leasing without year-round restrictions (i.e., not subject to NSO or CSU stipulations) by visual sensitivity, scenic quality, distance zone, and overall VRI class.

Table 4-9, Acres Open to Mineral Material Disposal by VRI Category, displays those lands that are open to mineral material disposal by visual sensitivity, scenic quality, distance zone, and overall VRI class.

Table 4-10, Acres Open to Nonenergy Mineral Leasing by VRI Category, displays those lands that are open to nonenergy mineral leasing by visual sensitivity, scenic quality, distance zone, and overall VRI class.

Table 4-8
Acres Open to Fluid Mineral Leasing by VRI Category

VRI Class	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Class I	0	0	0	0	0
Class II	322,800	388,800	196,800	388,800	353,300
Class III	1,056,200	1,080,300	596,200	1,088,500	999,000
Class IV	2,580,600	2,560,909	1,925,700	2,584,200	2,440,000
Undesignated	2,900	2,900	2,000	2,900	2,600

Source: BLM GIS 2014a, BLM GIS 2014b

Table 4-9
Acres Open to Mineral Material Disposal by VRI Category

VRI Class	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Class I	0	0	0	0	0
Class II	429,400	406,600	116,600	406,600	236,600
Class III	1,160,400	1,045,100	439,800	1,044,700	712,100
Class IV	2,643,400	2,538,400	1,243,900	2,538,300	2,070,514
Undesignated	3,900	3,900	2,000	3,900	3,600

Source: BLM GIS 2014a, BLM GIS 2014b

Table 4-10
Acres Open to Nonenergy Mineral Leasing by VRI Category

VRI Class	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Class I	0	0	0	0	0
Class II	388,900	366,100	117,200	366,100	252,700
Class III	1,086,700	971,300	447,800	971,300	693,000
Class IV	2,584,200	2,479,100	1,273,900	2,479,100	2,067,500
Undesignated	2,900	2,900	2,000	2,900	2,600

Source: BLM GIS 2014a, BLM GIS 2014b

Recreation and Visitor Services

Casual recreation use generally would not impact visual resources or the visual character of the area.

Management objectives for SRMAs target the identified recreational activities which provide specific recreational outcomes (i.e., experiences and benefits). VRM classes are established to manage visual resources to achieve the targeted outcomes. VRM Classes I and II are established for SRMAs that require no or low levels of development to achieve the management objectives. VRM Classes III and IV are established for SRMAs that require more development to achieve the management objectives and, therefore, more associated alterations of the

landscape. Although the VRM classes are used to provide the appropriate setting for identified recreational activities, they also influence the management of visual resources by, for example, limiting additional landscape modifications that may diminish the appeal of recreation lands and associated recreational outcomes.

Comprehensive Travel and Transportation Management

All forms of travel (i.e., motorized, mechanized, and nonmotorized/nonmechanized) can impact visual resources. However, limiting use or travel to routes can provide a measure of assurance against trail proliferation and promote the recovery of natural processes in the area, thereby potentially maintaining scenic quality. These impacts are generally confined to the route itself. In contrast, areas open to cross-country use can affect visual resources by affecting the visual character of the entire area. Impacts on visual resources include scarring of the terrain, trampled vegetation, and fugitive dust. Impacts are most notable from motorized vehicles because routes can become noticeable after only a few passes.

Closing areas to travel (both cross-country and on designated routes) can help maintain scenic quality by preventing the types of impacts that occur from such use. Scenic quality could be improved over the long term as routes are rehabilitated. It is also possible that distance zones could change in some areas, although this is unlikely as distance zones were primarily determined based on viewsheds from major highways.

Lands and Realty

Land use authorizations such as pipelines, transmission lines, access roads, and communication sites can affect visual resources by adding cultural modifications to the landscape and creating disturbances that change the vegetation pattern in an area. Both of these can affect the color of the landscape and, in extreme cases, the landform. In addition, these types of developments have the potential to impact the viewshed of sensitive landscapes next to the area of development. The magnitude of these impacts would be the greatest where scenic quality or sensitivity is higher. Furthermore, the creation of new access roads, if needed, could affect the distance zone of the area. If development were to occur in a seldom seen area, new access roads could make the development more accessible and thus visible to the public, potentially changing the distance zone from seldom seen to background or foreground/middleground. **Table 4-11**, Acres Open to Land Use Authorizations by VRI Category, displays those lands that are open to land use authorizations without restrictions (i.e., not subject to ROW exclusion or avoidance restrictions) by visual sensitivity, scenic quality, distance zone, and overall VRI class.

Managing ROW exclusion areas would protect visual resources by prohibiting new roads, pipelines, transmission lines, communication sites, wind, solar, and

Table 4-11
Acres Open to Land Use Authorizations by VRI Category

VRI Class	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Class I	0	0	0	0	0
Class II	429,400	243,700	108,400	250,100	215,600
Class III	1,160,600	708,900	415,400	687,200	651,742
Class IV	2,643,400	2,073,000	1,230,500	2,074,000	1,880,100
Undesignated	3,900	2,300	1,400	2,200	2,000

Source: BLM GIS 2014a, BLM GIS 2014b

geothermal development, and other land use authorizations. ROW avoidance areas would provide limited protection by requiring mitigation measures to minimize alteration of the physical setting. In other areas, utilities, such as new transmission lines, access roads, and related development, could permanently alter the visual quality of an area, especially if they do not repeat the basic elements of the landscape.

Communication facilities can impact visual resources by creating cultural modifications. In areas of low development, these types of structures often contrast with the form, line, color, or texture of the natural environment, making them more visible to the casual observer.

Renewable Energy

Solar development can impact visual resources by adding cultural modifications to the landscape (e.g., new structures, roads, and utility lines) and creating disturbances that change the vegetation pattern in an area. Both of these can affect the color of the landscape and, in extreme cases, the landform. The magnitude of these types of impacts would be the greatest where scenic quality or sensitivity is higher. In addition, these types of developments have the potential to impact the viewshed of sensitive landscapes next to the area of development. Furthermore, the creation of new access roads, are needed, could affect the distance zone of the area. If development were to occur in a seldom seen area, new access roads could make the development more accessible and thus visible to the public, potentially changing the distance zone from seldom seen to background or foreground/middleground.

Variance areas for utility-scale (greater than 20 megawatts) solar development are areas that have not been identified as exclusion areas for such development activities. Proposed utility-scale solar development in variance areas must go through a process to minimize impacts on resources, including visual resources. In the CCD, the fewer acres of variance areas mean more acres of exclusion areas for utility-scale solar. This would protect visual resources from such development. **Table 4-12**, Solar Variance Areas by VRI Category, displays those lands that could be available for utility-scale solar development subject to the

Table 4-12
Solar Variance Areas by VRI Category (acres)

VRI Class	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Class I	0	0	0	0	0
Class II	46,100	39,300	19,000	25,600	24,000
Class III	141,700	112,500	65,900	84,500	82,600
Class IV	716,200	619,900	492,500	560,600	522,700
Undesignated	1,300	1,200	500	800	800

Source: BLM GIS 2014a, BLM GIS 2014b

variance process a by visual sensitivity, scenic quality, distance zone, and overall VRI class.

The types of effects from wind development are similar to those caused by solar development. Managing ROW exclusion areas for wind would protect visual resources by prohibiting such development, including ancillary facilities such as roads and transmission lines. Managing ROW avoidance areas for wind would provide limited protection to visual resources by requiring mitigation measures to minimize alteration of the physical setting. In areas outside of avoidance areas, wind energy development facilities could permanently alter the visual quality of an area, especially if they do not repeat the basic elements of the landscape. **Table 4-13**, Acres Open to Wind Energy Development by VRI Category, displays those lands that are open to wind energy development without restrictions (i.e., not subject to exclusion or avoidance restrictions) by visual sensitivity, scenic quality, distance zone, and overall VRI class.

Table 4-13
Acres Open to Wind Energy Development by VRI Category

VRI Class	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Class I	0	0	0	0	0
Class II	509,600	331,900	187,500	325,000	273,500
Class III	1,460,004	874,000	591,600	858,200	773,800
Class IV	2,827,715	2,373,600	2,004,200	2,388,500	2,166,000
Undesignated	3,900	3,900	3,000	3,900	3,600

Source: BLM GIS 2014a, BLM GIS 2014b

Areas of Critical Environmental Concern

In general, ACECs would provide incidental protection for visual resources through restrictions on surface-disturbing activities that would affect the relevant and important values for which the ACEC is designed to protect. In cases where the relevant and important values of a potential ACEC include a scenic value, visual resources would be directly protected in that area. In addition, the viewsheds of adjacent lands would be protected, helping to preserve the scenic quality in those areas.

Wild and Scenic Rivers

Pending congressional action, interim protective management is applied to stream segments as eligible or suitable for inclusion in the NWSRS to protect the streams' free-flowing nature, outstandingly remarkable values, and water quality. Development and activities along stream segments classified as wild or scenic are limited in order to maintain stream segment values and to minimize disturbances to the character of the landscape. Furthermore, the BLM would manage stream segments with an identified scenic outstandingly remarkable value to protect such value. Therefore, visual resources along eligible or suitable stream segments would be maintained and, possibly, enhanced.

Visual Resources: Effects from Climate Management*Effects Common to All Alternatives*

All of the alternatives would comply with air quality standards and regulations. The intent of this is to preserve air quality and minimize changes to the climate, thereby preserving typical temperatures and water availability. Such impacts would be over the long term and would be similar across the alternatives.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Visual Resources: Effects from Vegetation Resources*Effects Common to All Alternatives*

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A does not contain actions for forest and woodlands management involving removal or thinning of trees within pinyon-juniper areas. Impacts on VRM from vegetation management would be identified based on site-specific proposals and NEPA analysis. Actions for restoration and rehabilitation of burned or WUI areas are driven by current BLM policy and the ESR handbook on a case-by-case bases. Alternative A contains minimal actions for controlling invasive species and noxious weeds. The BLM, however, would continue to

assign priority ranking of weed projects based on degree of infestation, location, resource availability, and resources at risk. Impacts on visual settings would slowly increase overtime and to varying degrees subject to management of existing VRI classes.

Effects under Alternative B

Under Alternative B, the BLM would thin and remove more acres of trees in pinyon-juniper areas than any other alternative. The BLM would prevent cheatgrass and other invasive species from dominating burned areas and altering the natural fire regime. The BLM would assign priority ranking of weed projects with a focus on areas with existing and new surface disturbance. Compared to Alternative A, Alternative B would allow for more harvesting of trees (20,000 acres), conduct more restoration of burned areas, and remove more invasive species and noxious weeds in the areas of resource uses. This alternative would cause the potential for the most impacts on visual settings as more acres would be treated. Impacts would dependent on location of treatments and VRM class management.

Effects under Alternative C

Under Alternative C, the BLM would thin and remove fewer acres of trees in pinyon-juniper areas than any other alternative (3,500 acres) and would design and implement ESR treatments for high value wildlife habitat. This alternative would assign priority ranking of weed projects with a focus on priority fish and wildlife habitats. Compared to Alternative A, Alternative C would allow for more harvesting of trees, conduct more restoration and rehabilitation of burned areas with high value wildlife habitat, and remove more invasive species and noxious weeds in the areas with priority fish and wildlife habitats. Potential impacts on the visual setting would be higher than under Alternative A.

Effects under Alternative D

Under Alternative D, the BLM would engage interested parties to develop a comprehensive restoration strategy prior to further treatment of pinyon-juniper woodlands. The BLM would design and implement ESR treatments to protect WUI areas from subsequent wildfires by using fire resistant species. The BLM would assign priority ranking of weed projects with a focus on the urban interface and recreation areas. Compared to Alternative A, Alternative D may allow for more harvesting of trees (depending on the comprehensive restoration strategy), would conduct more restoration and rehabilitation of WUI areas, and would remove more invasive species and noxious weeds in the urban interface and recreation areas. Impacts on the visual setting would be dependent on the number of acres identified for treatment and treatment locations as they relate to VRM management.

Effects under Alternative E

Under Alternative E, the BLM would thin and remove trees in pinyon-juniper areas. The BLM would design and implement ESR treatments to protect WUI

areas, improve high value wildlife habitat, and prevent invasive species dominance. The BLM would assign priority ranking of weed projects based on degree of infestation, location, and resource availability. Compared to Alternative A, Alternative E would allow for more harvesting of trees (8,500 acres), conduct more restoration and rehabilitation of both WUI areas and high value wildlife habitat, and continue to remove invasive species and noxious weeds (but based on fewer criteria). Potential impacts on visual settings would be greater than under Alternatives A, C, and D.

Visual Resources: Effects from Wildland Fire Ecology and Management

Effects Common to All Alternatives

Under Alternative A, the BLM would continue to manage wildfires according to Category A, B, C, or D designation of an area. The categories vary in the number of acres a fire is allowed to burn. Depending on location, the number of acres is 10 acres, 25 acres, 2,000 acres, or unspecified. There would be no new impacts on visual resources.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Under Alternative B, a full range of fire management activities (as outlined in the fire management plan) and options would be utilized to protect all identified values at risk. The BLM would utilize wildfire, prescribed fire, and nonfire fuels treatments to modify vegetation communities to achieve condition class, fuels, habitat, watershed, and riparian objectives. Compared to Alternative A, Alternative B would increase the use of fuels treatments, especially to meet habitat, watershed, and riparian objectives. The potential for impacts on visual settings would be subject to treatment location and VRM management class.

Effects under Alternative C

Under Alternative C, minimum impact suppression tactics would apply, whereby the environmental impacts of emergency fire management methods would be no greater than necessary to meet fire management objectives. The use of dozers would only be authorized when there is a threat to public safety or property damage. Chemical agents would not be allowed for suppression activities. The BLM would design and implement fuels treatments that would maintain, protect, and expand healthy resilient vegetative ecosystems. Compared to Alternative A, Alternative C would decrease the use of fire suppression tactics in some instances, depending on the nature and location of the fire, due to employing minimum impact suppression tactics. It would also increase the use of fuels treatments for all habitats in order to develop resilient vegetative ecosystems. Management actions that restrict suppression activities would reduce disturbance from suppression operations but would also increase the potential

for large fires. Large fires would increase the potential for impacts on visual setting.

Effects under Alternative D

Alternative D would be the same as Alternative B with respect to the range of fire management activities and options to protect all identified values at risk. The BLM would design and implement fuels treatments that would create fire safe communities resistant to catastrophic wildfire events. Compared to Alternative A, Alternative D would prioritize fire suppression tactics and increase the use of fuels treatments to protect communities. Impacts on visual settings would occur near urban interface areas from fuel treatments. Suppression activities should be more efficient near these areas which would reduce the size of burned areas reducing visual setting impacts. Areas outside of the urban interface maybe more prone large fire as fire near urban areas would have a higher priority.

Effects under Alternative E

Under Alternative E, a full range of fire management activities and options would be utilized to protect all values at risk and sustain healthy ecosystems within acceptable risk levels. Local agency administrators and resource advisors would convey protection priorities to incident commanders. The BLM would utilize wildfire, prescribed fire, and nonfire fuels treatments to create fire safe communities and modify vegetation communities to achieve condition class, fuels, habitat, watershed, and riparian objectives. Compared to Alternative A, Alternative E would apply the full range of suppression tactics providing input on protection priorities. It would also increase the use of fuels treatments, especially to protect communities and meet habitat, watershed, and riparian objectives. Impacts on visual settings would be less, as wildfires would be more effectively controlled. Fuelbreaks would create linear visual intrusions to settings. However, fuelbreaks would also reduce the potential for wildfire to spread which would reduce large areas impacted by fire and reduce impacts on the visual setting.

Visual Resources: Effects from Visual Resources Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under Alternative A, the BLM would continue to manage visual resources according to existing VRM class designations. This means that 3,494,900 acres would continue to lack a VRM class designation. As a result, there would continue to be the potential for activities to degrade the visual quality of the lands lacking a VRM class designation. This concern would remain greatest for the 358,900 acres of VRI Class II and III lands. There would be no new impacts on visual resources.

Effects under Alternative B

Alternative B would improve the management of visual resources by assigning a VRM class to all BLM-administered lands. However, 83 percent of VRI Class II lands would be designated as VRM Class III or IV lands. This would allow the visual quality of lands containing the most valued visual resources to degrade. For comparison, this same situation would only occur for 36 percent of the VRI Class II lands under Alternative A.

Under Alternative B, 56 percent of the VRI Class III lands would be designated as VRM Class IV. This would allow the visual quality of VRI Class III to degrade. For comparison, this same situation would only occur for 9 percent of the VRI Class III lands under Alternative A.

Effects under Alternative C

Alternative C would improve the management of visual resources by assigning a VRM class to all BLM-administered lands. However, 53 percent of VRI Class II lands would be designated as VRM Class III or IV lands. This would allow the visual quality of lands containing the most valued visual resources to degrade. For comparison, this same situation would only occur for 36 percent of the VRI Class II lands under Alternative A.

Under Alternative C, 47 percent of the VRI Class III lands would be designated as VRM Class IV. This would allow the visual quality of VRI Class III to degrade. For comparison, this same situation would only occur for 9 percent of the VRI Class III lands under Alternative A.

Effects under Alternative D

Alternative D would improve the management of visual resources by assigning a VRM class to all BLM-administered lands. However, 81 percent of VRI Class II lands would be designated as VRM Class III or IV lands. This would allow the visual quality of lands containing the most valued visual resources to degrade. For comparison, this same situation would only occur for 36 percent of the VRI Class II lands under Alternative A.

Under Alternative D, 71 percent of the VRI Class III lands would be designated as VRM Class IV. This would allow the visual quality of VRI Class III to degrade. For comparison, this same situation would only occur for 9 percent of the VRI Class III lands under Alternative A.

Alternative D contains the smallest percentage of VRI Class IV lands that have been designated as VRM Class I, II, or III. This demonstrates the intent to allow the scenic quality on these VRI Class IV lands to be subject to further alteration.

Effects under Alternative E

Alternative E would improve the management of visual resources by assigning a VRM class to all BLM-administered lands. However, 79 percent of VRI Class II lands would be designated as VRM Class III or IV lands. This would allow the

visual quality of lands containing the most valued visual resources to degrade. For comparison, this same situation would only occur for 36 percent of the VRI Class II lands under Alternative A.

Under Alternative E, 45 percent of the VRI Class III lands would be designated as VRM Class IV. This would allow the visual quality of VRI Class III to degrade. For comparison, this same situation would only occur for 9 percent of the VRI Class III lands under Alternative A.

Alternative E contains the highest percentage of VRI Class IV lands that have been designated as VRM Class I, II, or III. This demonstrates the intent to protect the scenic quality on these VRI Class IV lands from further alteration.

Visual Resources: Effects from Livestock Grazing Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under Alternative A, the BLM would continue to manage 4,796,600 acres as available for livestock grazing. Impacts on visual resources would continue as described directly above. There would be no new impacts on visual resources.

Effects under Alternative B

Under Alternative B, the BLM would manage 4,797,200 acres as available for livestock grazing, approximately the same number as Alternative A. Consequently, impacts on visual resources would be similar to Alternative A.

Effects under Alternative C

Under Alternative C, the BLM would manage 2,101,300 acres available for livestock grazing. Impacts on visual resources would continue as described under Alternative A, except fewer acres would experience impacts.

Effects under Alternative D

Under Alternative D, the BLM would manage 4,792,600 acres as available for livestock grazing, which is only slightly less than Alternative A. Consequently, impacts on visual resources would be similar to Alternative A.

Effects under Alternative E

Under Alternative E, the BLM would manage 4,797,200 acres as available for livestock grazing, which is only slightly more than Alternative A. Consequently, impacts on visual resources would be similar to Alternative A.

Visual Resources: Effects from Geology and Mineral Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A maintains 839,100 acres closed to fluid mineral leasing, 564,200 acres would be managed as closed to mineral material disposal, and 738,800 acres closed to nonenergy mineral leasing. Alternative A closes 194,900 acres to locatable mineral entry and would pursue withdrawal of 3,700 acres from operation of locatable minerals. Closed and withdrawn areas would reduce the potential disturbance from exploration and development of mineral resources and would provide protection to visual settings.

Effects under Alternative B

Alternative B proposes to close 768,500 acres to fluid mineral leasing, 807,200 acres would be managed as closed to mineral material disposal, and 981,900 acres closed to nonenergy mineral leasing. Alternative B closes 194,900 acres to locatable mineral entry and proposes withdrawal of 439,600 acres from operation of locatable minerals. Closed and withdrawn areas would reduce the potential disturbance from exploration and development of mineral resources and would provide protection to visual settings. Fewer impacts would occur to visual settings compared to alternative A.

Effects under Alternative C

Alternative C would close 2,081,700 acres to fluid mineral leasing, 3,004,800 acres would be managed as closed to mineral material disposal, and 2,960,800 acres closed to nonenergy mineral leasing. Alternative C closes 194,900 acres to locatable mineral entry and proposes withdrawal of 117,500 acres from operation of locatable minerals. Closed and withdrawn areas would reduce the potential disturbance from exploration and development of mineral resources and would provide protection to visual settings. This alternative would provide the highest number of acres with mineral restrictions affording the highest level of protection to visual resources.

Effects under Alternative D

Alternative D would close 737,000 acres to fluid mineral leasing, 807,700 acres would be managed as closed to mineral material disposal, and 981,900 acres closed to nonenergy mineral leasing. Alternative D would also close 194,900 acres to locatable mineral entry and proposes withdrawal of 440,800 acres from operation of locatable minerals. Closed and withdrawn areas would reduce the potential disturbance from exploration and development of mineral resources and would provide protection to visual settings. Impacts would be similar to Alternative C except more acres would be proposed for withdrawal under locatable minerals.

Effects under Alternative E

Alternative E, proposes 1,007,200 acres closed to fluid mineral leasing, 1,778,700 acres would be managed as closed to mineral material disposal, and 1,785,900 acres closed to nonenergy mineral leasing. Alternative E closes 194,900 acres to locatable mineral entry and proposes withdrawal of 470,600

acres from operation of locatable minerals. Closed and withdrawn areas would reduce the potential disturbance from exploration and development of mineral resources and would provide protection to visual settings. This alternative provides greater protection of visual resources compared to Alternative A but fewer compared to the other Alternative C.

Visual Resources: Effects from Recreation and Visitor Services

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

There would continue to be 67,700 acres of SRMAs and 0 acres of ERMAs. Although there are only two SRMAs, other recreation activities in unofficial recreation areas occur in the planning area. When not properly planned and managed, unofficial recreation areas (such as in the urban interface areas) can create unintended impacts on visual resources. Depending on the type and location of this recreation, loss of vegetation, litter, or scarring of the terrain can occur, thereby degrading the scenic quality in unofficial recreation areas. There would be no new impacts on visual resources other than what is occurring under current management.

Effects under Alternative B

Under Alternative B, there would be six SRMAs (totaling 76,100 acres) and eight ERMAs (totaling 1,678,320 acres). Compared to Alternative A, there would be a notable increase in the number of ERMA acres. The impacts on visual resources would be concentrated in these areas. Designating specific recreation management areas and enforcing proper use of the recreation management areas would alleviate impacts on visual resources in unofficial recreation areas (such as in the urban interface areas).

Effects under Alternative C

Under Alternative C, there would be three SRMAs (totaling 74,700 acres) and 15 ERMAs (totaling 1,528,760 acres). Compared to Alternative A, there would be a notable increase in the number of ERMA acres. The impacts on visual resources would be concentrated in these areas. Designating specific recreation management areas and enforcing proper use of the recreation management areas would alleviate impacts on visual resources in unofficial recreation areas (such as in the urban interface areas).

Effects under Alternative D

Under Alternative D, there would be four SRMAs (totaling 67,100 acres) and six ERMAs (totaling 292,610 acres). Compared to Alternative A, there would be an increase in the number of ERMA acres. The impacts on visual resources would be concentrated in these areas. Designating specific recreation management areas and enforcing proper use of the recreation management areas would

alleviate impacts on visual resources in unofficial recreation areas (such as in the urban interface areas).

Effects under Alternative E

Under Alternative E, there would be six SRMAs (totaling 106,120 acres) and 15 ERMAs (totaling 2,085,730 acres). Compared to Alternative A, there would be a notable increase in the number of ERMA acres. The impacts on visual resources would be concentrated in these areas. Designating specific recreation management areas and enforcing proper use of the recreation management areas would alleviate impacts on visual resources in unofficial recreation areas (such as in the urban interface areas).

Visual Resources: Effects from Comprehensive Travel and Transportation Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under Alternative A, most of the decision area is open to cross-country travel, resulting in the highest impacts on visual resources. A small number of places are closed to motorized or mechanized travel and visual resources would be maintained to a certain degree in these areas.

Effects under Alternatives B, C, D, and E

Under the action alternatives, only select areas would be managed as open to cross-country travel, reducing the impact from such use throughout the decision area. Instead, travel throughout most of the decision area would be limited to existing roads, primitive roads, and trails until subsequent route designation occurs. More areas would also be closed to motorized or mechanized travel under each of the action alternatives compared to Alternative A. The *Nature and Types of Effects* would be the same under all alternatives, though the potential magnitude varies.

Visual Resources: Effects from Lands and Realty

Effects Common to All Alternatives

Locating utilities in designated utility corridors would concentrate surface-disturbing activities in the corridors. Correspondingly, impacts on visual resources would be concentrated in these locations instead of dispersed across the landscape.

Effects under Alternative A

Alternatives A and D have the fewest ROW exclusion acres. Alternative A has the fewest ROW avoidance acres. Most lands in the planning area are available for land use authorizations without restrictions (i.e., not in ROW avoidance or exclusion areas). Only WSAs are managed as ROW exclusion areas due to the

nonimpairment standard for these areas. Potential for impacts would be the greatest under this alternative. There would be no new impacts on visual resources.

Effects under Alternative B

Alternative B has more acres managed as ROW avoidance than Alternatives A and C, but fewer than Alternatives D and E. Alternatives B, D, and E would reduce the number of VRI Class II and III acres that are open to ROWs.

Effects under Alternative C

Alternative C has the most ROW exclusion acres. Alternative C would reduce the most VRI Class II and III acres that are open to ROWs.

Effects under Alternative D

Alternatives A and D have the fewest ROW exclusion acres. Alternatives B, D, and E would reduce the number of VRI Class II and III acres that are open to ROWs.

Effects under Alternative E

Alternatives B, D, and E would reduce the number of VRI Class II and III acres that are open to ROWs.

Visual Resources: Effects from Renewable Energy (Wind and Solar)

Effects Common to All Alternatives

While WSAs are not specifically exclusion areas for renewable energy, managing them according to the nonimpairment standard would essentially preclude wind or solar development from occurring, protecting visual resources in these areas.

Effects under Alternative A

Under Alternative A, the most acres would be available for renewable energy development. No areas would be restricted from wind energy development and the most acres would be available for utility-scale solar development subject to the variance process.

Effects under Alternatives B, C, D, and E

Under the action alternatives, fewer acres would be available for renewable energy development than under Alternative A. The *Nature and Types of Effects* would be the same under all alternatives, though the potential magnitude varies. Fewer acres would be identified as variance areas for utility-scale solar development, meaning more acres would be identified as exclusion areas. The reduction in variance area from Alternative A would be due to additional proposed ACECs, SRMAs, ROW avoidance and exclusion areas, NSO stipulations, and VRM Class I and II areas. Under Alternatives B, D, and E, no areas would be excluded from wind energy development but areas would be identified as avoidance areas for such development. Under Alternative C, the Virginia City National Landmark Historic District ACEC would be an exclusion

area for wind energy development and other areas would be identified as avoidance areas for such development.

Visual Resources: Effects from Areas of Critical Environmental Concern

Effects Common to All Alternatives

The nature and types of incidental effects would be similar under all alternatives. The magnitude of the impact would vary by the number and size of ACECs proposed for designation under each alternative.

The Incandescent Rocks Scenic ACEC would remain an ACEC under each alternative and would continue to be managed according to VRM Class II objectives. The objective of this class is to *retain* the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

Effects under Alternatives A, B, D, and E

Except for the Incandescent Rocks Scenic ACEC, no potential ACECs have a scenic relevant and important value. Impacts under Alternatives A, B, D, and E are described under *Effects Common to All Alternatives*.

Effects under Alternative C

In addition to the Incandescent Rocks Scenic ACEC, the Lassen Red Rock Scenic ACEC would be designated to protect scenic values. The BLM would manage the area as VRM Class II; impacts would be the same as those described for the Incandescent Rocks Scenic ACEC.

Visual Resources: Effects from Wild and Scenic Rivers

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under Alternative A, the BLM would manage eligible stream segments to protect the streams' free-flowing nature, outstandingly remarkable values, and water quality. All segments have a scenic outstandingly remarkable value, so visual resources would be protected within the study corridors.

While no specific allocations are identified for each segment, the East Fork of the Carson River Segment I is within the Carson-Iceberg WSA which is managed according to VRM Class I objectives and also precludes most new surface-disturbing activities that might impact visual resources. As long as the WSA remains in place, visual resources would be protected in the study corridor of this segment.

Effects under Alternative B

Under Alternative B, all eligible stream segments would be determined not suitable for inclusion in the NWSRS and would be released from interim protective management. Visual resources would not receive protection within the study corridors under this alternative.

Effects under Alternative C

Like under Alternative A, the BLM would manage suitable stream segments to protect the streams' free-flowing nature, outstandingly remarkable values, and water quality. All segments have a scenic outstandingly remarkable value, so visual resources would be protected within the study corridors. Impacts on visual resources along the East Fork of the Carson River Segment 1 would be the same as those identified for Alternative A.

The BLM would manage the East Fork of the Carson River Segments 2 and 3 as VRM Class II, which allows for low levels of changes to retain the existing character of the landscape. While the recreational tentative classification along the East Fork of the Carson River Segment 2 would allow for more development than the other two segments, any such activities must meet VRM Class II objectives so the landscape is expected to remain similar to current levels.

Effects under Alternative D

Impacts would be similar to those described for Alternative C. However, the BLM would manage the East Fork Carson River Segment 2 as VRM Class III. This would allow moderate levels of changes to partially retain the existing character of the landscape. Because the tentative classification of the segment is recreational, more development would be allowed that could impact the visual quality of the landscape within the study corridor. The BLM would manage the East Fork Carson River Segment 3 for a recreational classification. This would allow more development than the scenic classification identified under Alternative C. However, the BLM would manage the area as VRM Class II, like Alternative C, so impacts on visual resources are expected to be similar.

Effects under Alternative E

Impacts would be the same as those identified for Alternative C.

Visual Resources: Cumulative Effects*Past and Present Actions*

Projects and activities identified as having the greatest likelihood to generate potential cumulative impacts when added to the RMP alternatives are displayed in **Table 4-1**, Past, Present, and Reasonably Foreseeable Projects, Plans, or Actions that Make up the Cumulative Impact Scenario. Of the items in the table, the following past and present topics involve the most notable impacts on visual resources:

- Energy and minerals development
- Renewable energy
- Vegetation management
- Livestock grazing
- Recreation and visitor use
- Invasive/non-native species and noxious weeds
- Wildland fire management

These topics generally involve surface disturbances or the construction of roads, infrastructure, and facilities, all of which affect visual resources as described above under *Nature and Types of Effects*.

Additionally, the present VRM classifications throughout the planning area do not adequately reflect the visual quality of the region and mitigation standards and design alternatives are not sufficiently outlined in the Consolidated RMP or subsequent activity plans. Approximately 3,494,900 acres lacks VRM Class objectives for managing visual resources. This can threaten the integrity of visual resources.

Reasonably Foreseeable Actions

The topics discussed above under Past and Present Actions are expected to continue to affect visual resources. With respect to impact of visual resources, the following are anticipated to represent the most prominent concerns: unauthorized dispersed recreation uses (such as in the urban interface), travel corridors, popular recreation sites, areas with multiple or conflicting resource use demands, mineral and energy development, and wildland fire management.

Incremental Cumulative Impact – Combined Past, Present, Reasonably Foreseeable Actions – All Alternatives

Incremental cumulative impacts would be similar for Alternatives B, D, and E. Alternative A would have more incremental cumulative impacts, because of the lack of VRM class management objectives for 3,494,900 acres. Alternative C would have fewer incremental cumulative impacts, because of the greater number of acres of VRM Class I and II lands, ROW exclusion lands, ACECs, and WSRs, all of which would limit opportunities for actions to have cumulative impacts that degrade visual resources.

4.3.12 Lands with Wilderness Characteristics

This section discusses impacts on lands with wilderness characteristics from proposed management actions of other resources and resource uses. Existing conditions are described in **Section 3.2.12, Lands with Wilderness Characteristics**.

Summary

Actions for managing areas identified as having lands with wilderness characteristics apply under Alternatives C and E only. Under Alternatives C and E, the actions outlined for management of these areas would provide protection for the indicators of wilderness characteristics by limiting or closing activities and development within these areas. Although the inventoried lands would not be managed for lands with wilderness characteristics under Alternatives A, B, or D, effects were analyzed to represent the management actions of overlapping resources such as ACECs and VRM, which have actions that will impact or protect wilderness characteristics in these areas.

Methods of Analysis

Methods and Assumptions

There are currently no lands being managed for wilderness characteristics outside of existing WSAs in the planning area. An updated inventory for wilderness characteristics was performed by the BLM, and a draft report will be available fall of 2014. 12 units within the planning area were inventoried for wilderness characteristics totaling 416,500 acres. Alternatives A, B, and D would not be managed to maintain wilderness characteristics on any of these acres, but Alternative C would be managed to maintain wilderness characteristics in all 416,500 acres within the 12 inventoried units and Alternative E would be managed to maintain wilderness characteristics on 332,600 acres within 8 units. See **Section 3.2.12, Lands with Wilderness Characteristics**.

Assumptions

- Use and development of BLM-administered lands will increase into the foreseeable future.
- The proposed management prescribed for an area with wilderness characteristics would protect the qualities that are associated with the area.
- Any proposed action within an area to be managed as having wilderness characteristics would be processed in accordance with the policies stated in BLM Manual 6320 (BLM 2012c).
- Wilderness characteristics would be protected in the long term from management actions that include vegetation treatments. These treatments improve ecosystem composition, structure, and diversity, which would improve the overall apparent naturalness of the area. In the short term, however, wilderness characteristics would be impacted due to an increase in human presence and vehicle and road use.

Management for the following resources would not result in an effect on lands with wilderness characteristics: air quality management, climate management, soil and water resources, fish and wildlife management, special status species

management, wildland fire ecology and management, cultural resources management, paleontological resources management, caves and cave resources, forestry and woodland product management, backcountry byways, national trails, wild and scenic rivers, wilderness study areas, backcountry wildlife conservation areas, tribal interests, public health and safety, interpretation and environmental education, socio and economic conditions, environmental justice, and facilities and transportation maintenance.

Indicators

Lands with wilderness characteristics are parcels that meet a size requirement of 5,000 roadless acres (or exception criteria) and contain naturalness and either outstanding opportunities for solitude or primitive and unconfined recreation. In addition, they may also possess supplemental values (e.g., ecological, geological, or other features of scientific, educational, scenic, or historical value). They are identified through a process described in BLM Manual 6310 – Conducting Wilderness Characteristics Inventory on BLM Lands (BLM 2012b), and considered in the land use planning process under BLM Manual 6320 – Considering Lands with Wilderness Characteristics in the BLM Land Use Planning Process (BLM 2012c).

Indicators used in the lands with wilderness characteristics analysis include the following:

- **Size:** A parcel inventoried for lands with wilderness characteristics must be a roadless area with over 5,000 acres of contiguous BLM-administered lands. This acreage determination does not include state or private lands within the parcel. Some exceptions apply, as described in BLM Manual 6310 (BLM 2012b).
- **Naturalness:** Lands and resources exhibit a high degree of naturalness, are affected primarily by the forces of nature, and are areas where the imprint of human activity is substantially unnoticeable.
- **Outstanding opportunities for solitude:** The ability for visitors to have outstanding opportunities for solitude is impacted by the sights, sounds, and evidence of other people. Outstanding opportunities for solitude exist when these impacts are rare or infrequent and where visitors can be isolated, alone, or secluded from others.
- **Outstanding opportunities for primitive and unconfined types of recreation:** Visitors may have outstanding opportunities for primitive and unconfined types of recreation where the use of the area is through nonmotorized, nonmechanical means, and where no or minimal developed recreation facilities are encountered.
- **Supplemental Values:** Although not necessary for an area to contain wilderness characteristics, when an area's updated wilderness

inventory is being performed if the following features are found they will be noted: ecological, geological, or other features of scientific, educational, scenic, or historical value that may enhance the characteristics of the area.

Nature and Type of Effects

BLM-administered lands possessing the above values may be managed to maintain some or all of those characteristics. Wilderness characteristics such as solitude, primitive recreation, and naturalness are a part of the land use planning process and will be evaluated and addressed along with all other resource values and uses.

In general, wilderness characteristics conditions tend to be more qualitative in nature, measured by the overall visual quality and naturalness of an area that may be affected by changes to levels of recreational activities, development, and surrounding land use. Indicators that can quantitatively be measured include changes to the frequency and number of routes, including the number of unauthorized trails, the number of encounters with other users, and increased requests for use of areas with wilderness characteristics for renewable or nonrenewable resource development.

Areas to be managed to protect wilderness characteristics should retain a high degree of naturalness where the imprint of humans on lands and resources is substantially unnoticeable. Furthermore, outstanding opportunities for solitude and primitive or unconfined types of recreation should be maintained or enhanced.

Lands with Wilderness Characteristics: Effects from Wild Horse and Burro Management

Effects Common to All Alternatives

Impacts on apparent naturalness from wild horse and burro management in HMAs and HAs would occur due to soil compaction and browsing into defined areas. This would concentrate such impacts as noxious weed invasion and plant reduction in certain areas.

Effects under Alternative A

Under Alternative A, the BLM would not specifically manage lands to protect wilderness characteristics. There are currently 178,900 acres of HA and 177,600 acres of HMA within areas inventoried for lands with wilderness characteristics. Impacts would be the same as those described under *Effects Common to All Alternatives*.

Effects under Alternative B

Under Alternative B, the BLM would not specifically manage lands to protect wilderness characteristics. There would be 178,900 acres of HA and 143,200 acres of HMA within inventoried lands with wilderness characteristics. Impacts

would be similar to Alternative A, but less in degree due to fewer acres being managed as HMA.

Effects under Alternative C

Under Alternative C, the BLM would manage lands to protect wilderness characteristics. There would be 178,900 acres of HA and 173,400 acres of HMA within inventoried lands with wilderness characteristics. Impacts would be similar to Alternative A, but less in degree due to fewer acres being managed as HMA.

Effects under Alternative D

Under Alternative D, the BLM would not specifically manage lands to protect wilderness characteristics. There would be 178,900 acres of HA and 143,200 acres of HMA within inventoried lands with wilderness characteristics. Impacts would be the same as Alternative B.

Effects under Alternative E

Under Alternative E, the BLM would manage lands to protect wilderness characteristics. There would be 178,900 acres of HA and 173,400 acres of HMA within inventoried lands with wilderness characteristics. Impacts would be the same as Alternative C.

Lands with Wilderness Characteristics: Effects from Lands with Wilderness Characteristics

Effects Common to All Alternatives

Management of lands with wilderness characteristics would prevent surface disturbance activities in certain areas within the CCD. However, these management actions would impact vegetation improvement treatments on these lands, which would have impacts similar to those described under Methods and Assumptions. Lands with wilderness characteristics would only be managed to protect those characteristics on 416,500 acres in Alternative C and 332,600 acres in Alternative E. The other alternatives include limitations and restrictions based on other resources that occur in these areas, but lands would not be specifically managed for wilderness characteristics for under Alternatives A, B, or D.

Effects under Alternative A

Under Alternative A, the BLM would not specifically manage lands to protect wilderness characteristics. The areas inventoried for wilderness characteristics would be managed for multiple use and sustained yield which would allow for some human disturbances throughout the landscape.

Effects under Alternative B

Under Alternative B, the BLM would not specifically manage lands to protect wilderness characteristics, and impacts would be similar to Alternative A

Effects under Alternative C

Alternative C would provide the greatest protection for lands with wilderness characteristics by specifically managing 416,500 acres to protect wilderness characteristics and implementing restrictions and stipulations in these areas, including managing as VRM Class I and closures to fluid mineral leasing, nonenergy mineral leasing, and mineral material disposal. Any potential new ROWs and maintenance of existing facilities would be evaluated and managed as ROW avoidance areas. Areas within the lands with wilderness characteristics would be managed as ROW exclusion zones for utility-scale renewable energy.

Effects under Alternative D

Under Alternative D, the BLM would not specifically manage lands to protect wilderness characteristics, and impacts would be similar to Alternative A.

Effects under Alternative E

Alternative E would provide protection similar to Alternative C, but to a slightly lesser degree due to fewer acres being managed with a VRM Class II objective and fluid mineral leasing being managed with an NSO stipulation. Any potential new ROWs and maintenance of existing facilities would be managed as ROW avoidance areas.

Lands with Wilderness Characteristics: Effects from Visual Resources

Effects under Alternative A

Under Alternative A, the BLM would not specifically manage lands to protect wilderness characteristics. Lands within the inventoried areas are currently managed with 10,500 acres of VRM Class II objectives, 54,700 acres of VRM Class III objectives, and 43,400 acres of VRM Class IV objectives. The VRM Class II designation would allow for greater retention of the existing naturalness with minimal changes to the landscape, while the VRM Class III and Class 4 designation areas would allow for a greater change in the landscape, which would allow a higher range of disturbances that impact the overall apparent naturalness of the area.

Effects under Alternative B

Under Alternative B, the BLM would not specifically manage lands to protect wilderness characteristics. Lands within the inventoried areas would be managed with 9,200 acres of VRM Class II, 201,000 acres of VRM Class III, and 206,000 acres of VRM Class IV. The VRM Class II designation would allow for retention of the existing naturalness with minimal changes to the landscape, while the VRM Class III and Class IV designation areas would allow for a greater change in the landscape which would allow a higher range of disturbances that impact the overall apparent naturalness of the area. Apparent naturalness would be impacted considerably more under this alternative when compared to Alternative A because more acreage would be managed as VRM Class III and VRM Class IV.

Effects under Alternative C

Under Alternative C, the BLM would manage lands to protect wilderness characteristics. The BLM would manage 416,300 acres as VRM Class I, which would allow a low level of changes to the landscape and offer the most protection from impacts on apparent naturalness than any other alternative.

Effects under Alternative D

Under Alternative D, the BLM would not specifically manage lands to protect wilderness characteristics. However, the BLM would manage 1,100 acres as VRM Class II and 415,000 acres as VRM Class IV. The VRM Class II designation would allow for retention of the existing naturalness with minimal changes to the landscape, while the VRM Class IV areas would allow for a greater change in the landscape which would allow a higher range of disturbances that impact the overall apparent naturalness of the area. Apparent naturalness would be impacted considerably more under this alternative when compared to Alternative A because more acreage would be managed as VRM Class IV.

Effects under Alternative E

Under Alternative E, the BLM would manage lands to protect wilderness characteristics. The BLM would manage 340,600 acres as VRM Class II and 43,100 acres as VRM Class III, which would only allow for minimal to moderate changes to the landscape and offer more protection from impacts on apparent naturalness when compared to Alternative A.

Lands with Wilderness Characteristics: Effects from Geology and Minerals

Effects under Alternative A

Under Alternative A, the BLM would not specifically manage lands to protect wilderness characteristics. Under Alternative A, 402,600 acres within inventoried lands are managed as open to each of the following uses: fluid minerals, mineral material disposal and nonenergy leasing. The degree of impact would depend on the type and intensity of development, but any surface-disturbing activities are expected to lower the apparent naturalness and any outstanding opportunities for solitude and primitive and unconfined recreation.

Effects under Alternative B

Under Alternative B, the BLM would not specifically manage lands to protect wilderness characteristics. Under Alternative B, 402,600 acres within inventoried lands would be managed as open to fluid minerals. The BLM would manage 341,400 acres as open to mineral material disposal and 74,800 acres as closed to mineral material disposal. The BLM would also manage 327,800 acres as open to nonenergy leasing and 88,400 acres as closed to nonenergy leasing. The BLM would apply CSU stipulations to leases on 244,500 acres and NSO stipulations to leases on 67,000 acres. Impacts would be similar to Alternative A, but to a lesser degree due to the acres closed to development and restrictions on surface disturbance from the CSU and NSO stipulation.

Effects under Alternative C

Under Alternative C, the BLM would manage lands to protect wilderness characteristics. The BLM would manage 416,300 acres within inventoried lands as closed to fluid minerals, mineral material disposal, and nonenergy leasing. This alternative would offer the most protection to apparent naturalness and opportunities for solitude and primitive types of recreation due to the restrictions on these surface disturbing activities.

Effects under Alternative D

Under Alternative D, the BLM would not specifically manage lands to protect wilderness characteristics. This alternative would allow for 402,600 acres within inventoried lands to be managed as open to fluid minerals. The BLM would also manage 341,400 acres as open to mineral material disposal and 74,800 acres as closed to mineral material disposal. The BLM would manage 327,800 acres as open to nonenergy leasing and 88,400 acres as closed to nonenergy leasing. The BLM would apply CSU stipulations to leases on 223,700 acres and NSO stipulations to leases on 137,900 acres. Impacts would be similar to those in Alternative B but slightly less due to more acres being managed with a NSO stipulation.

Effects under Alternative E

Under Alternative E, the BLM would manage lands to protect wilderness characteristics. The BLM would manage 384,500 acres as open and 31,800 acres as closed to fluid minerals. The BLM would manage 184,800 acres as closed to mineral material disposal and 356,600 acres as closed to nonenergy leasing. The BLM would apply CSU stipulations to leases on 212,900 acres and NSO stipulations to 350,000 acres. Impacts would be similar to those in Alternative B but considerably less due to more acres being managed with NSO stipulations.

Lands with Wilderness Characteristics: Effects from Livestock Grazing*Effects under Alternative A*

Under Alternative A, the BLM would not specifically manage lands to protect wilderness characteristics. Under Alternative A, the BLM would manage 416,300 acres as available to livestock grazing. Fences, stock trails, springs, and stock ponds that need to be maintained will impact the apparent naturalness and opportunities for solitude and primitive recreation due to structures and access routes facilitating these human developments used for livestock grazing.

Effects under Alternative B

Under Alternative B, the BLM would not specifically manage lands to protect wilderness characteristics. Under Alternative B, the BLM would manage 416,300 acres as available to livestock grazing. Impacts would be the same as those described under Alternative A.

Effects under Alternative C

Under Alternative C, the BLM would manage lands to protect wilderness characteristics. The BLM would manage 196,400 acres as available to livestock grazing, and 219,900 acres as unavailable to livestock grazing. Impacts would be similar to those in Alternative A but to a lesser degree due to fewer acres being available for livestock grazing. New or expanded range improvements would be prohibited, which would provide the most protection to apparent naturalness of all the alternatives due to less human made developments occurring on the landscape.

Effects under Alternative D

Under Alternative D, the BLM would not specifically manage lands to protect wilderness characteristics. Under Alternative D, 416,300 acres would be available to livestock grazing. Impacts would be the same as those described under Alternative A.

Effects under Alternative E

Under Alternative E, the BLM would manage lands to protect wilderness characteristics. The BLM would manage 416,300 acres as available to livestock grazing. Impacts would be the same as those described under Alternative A.

Lands with Wilderness Characteristics: Effects from Recreation

Effects Common to All Alternatives

Managing BLM-administered lands to provide dispersed recreation could directly degrade wilderness characteristics throughout the CCD through human disturbance, noise, weed introduction or spread, and impacts on vegetation. Depending on the type of activities allowed in the area, impacts would vary with the duration and intensity of any recreational activities and could be short term or long term.

Effects under Alternative A

Under Alternative A, the BLM would not specifically manage lands to protect wilderness characteristics. When areas where nonmechanized and nonmotorized types of recreation such as picnicking, hiking, backpacking, horse riding, or camping are available this increases the opportunities for a visitor to experience an outstanding opportunity for primitive types of recreation.

Effects under Alternative B

Under Alternative B, the BLM would not specifically manage lands to protect wilderness characteristics. Alternative B would be managed to contain 255,500 acres of ERMA's that overlap with lands within the areas inventoried for wilderness characteristics. Specific ERMA management objectives would determine the impact on apparent naturalness and outstanding opportunities for solitude and primitive types of recreation. For example, ERMA's with recreational activities such as horseback riding or hiking would enhance opportunities for primitive recreation whereas ERMA's with OHV use would

detract from naturalness and the ability to find solitude due to soil compaction or vegetation trampling that can occur.

Effects under Alternative C

Under Alternative C, the BLM would manage lands to protect wilderness characteristics. 264,500 acres would be managed as ERMAs. Impacts would be similar to those in Alternative B, but more intensive due to more ERMA acreage. Also, competitive motorized events would be prohibited in areas being managed for having wilderness characteristics which would provide the most protection to apparent naturalness than any other alternative.

Effects under Alternative D

Under Alternative D, the BLM would not specifically manage lands to protect wilderness characteristics. 23,300 acres would be managed as ERMAs. Impacts would be similar to those in Alternative B, but much less intensive due to less ERMA acreage.

Effects under Alternative E

Under Alternative E, the BLM would manage lands to protect wilderness characteristics. 315,700 acres would be managed as ERMAs. Impacts would be similar to those in Alternative B, but more intensive due to more ERMA acreage.

Lands with Wilderness Characteristics: Effects from Comprehensive Travel and Transportation Management

Effects under Alternative A

Under Alternative A, the BLM would not specifically manage lands to protect wilderness characteristics. The BLM would manage 5,500 acres of units inventoried for lands with wilderness characteristics as closed to motorized travel, 70,000 acres as limited to existing routes, and 340,800 acres as open to unrestricted vehicle use. This alternative allows for the most acres to be open to unrestricted vehicle use out of all alternatives. Apparent naturalness and outstanding opportunities for solitude and primitive types of recreation are impacted by the increase in human and vehicle presence, noise, soil compaction and vegetation trampling.

Effects under Alternative B

Under Alternative B, the BLM would not specifically manage lands to protect wilderness characteristics. The BLM would manage 5,500 acres of units inventoried for lands with wilderness characteristics as closed to motorized travel and 410,700 acres as limited to existing routes. Impacts such as vegetation trampling would be greatly reduced in this alternative compared to Alternative A because nearly all of the acreage within the lands inventoried for wilderness characteristics would be managed as being limited to existing routes.

Effects under Alternative C

Under Alternative C, the BLM would manage lands to protect wilderness characteristics. The BLM would manage 140,600 acres of units inventoried for lands with wilderness characteristics as closed to motorized travel and 270,600 acres as limited to existing routes. Impacts would be similar to Alternative B, but less in degree because many more acres within the lands inventoried for wilderness characteristics would be managed as closed to travel.

Effects under Alternative D

Under Alternative D, the BLM would not specifically manage lands to protect wilderness characteristics. The BLM would manage 5,500 acres of units inventoried for lands with wilderness characteristics as closed to motorized travel and 410,700 acres as limited to existing routes. Impacts would be the same as Alternative B.

Effects under Alternative E

Under Alternative E, the BLM would manage lands to protect wilderness characteristics. The BLM would manage 5,500 acres of units inventoried for lands with wilderness characteristics as closed to motorized travel, and 410,700 acres would be limited to existing routes. Impacts would be the same as Alternative B.

Lands with Wilderness Characteristics: Effects from Lands and Realty

Effects under Alternative A

Under Alternative A, the BLM would not specifically manage lands to protect wilderness characteristics. Currently, 1,200 acres are suitable or available for disposal, and 500 acres are in petition for withdrawal from mineral entry on lands overlapping with lands inventoried for wilderness characteristics. The impact of disposing lands would vary depending on what human made developments occurred in the area. Withdrawn lands would increase the areas apparent naturalness due to decreased surface disturbances caused from mineral development. If ROWs were located on these lands, there would be impacts on the size of the area, naturalness, and primitive and unconfined recreation. Depending on the extent of the ROWs, wilderness characteristics could be eliminated.

Effects under Alternative B

Under Alternative B, the BLM would not specifically manage lands to protect wilderness characteristics. The BLM would consider 1,200 acres to be suitable or available for disposal. The BLM would petition 75,800 acres for withdrawal from mineral entry and would manage 204,800 acres as ROW avoidance. Impacts would be similar to Alternative A, but to a lesser degree due to more acres being in petition for withdrawal from mineral entry and being managed as ROW avoidance.

Effects under Alternative C

Under Alternative C, the BLM would manage lands to protect wilderness characteristics. The BLM would petition 10,200 acres for withdrawal from mineral entry. The BLM would also manage 123,400 acres as ROW avoidance and 292,900 acres as ROW exclusion. Impacts would be less than all the other alternatives on apparent naturalness and opportunities for solitude and primitive recreation due to the reduction in surface disturbing activities from managing more acres as ROW avoidance and exclusion areas. Also, any new ROWs and maintenance of existing facilities would be evaluated and allowed only under certain circumstances (see *Lands and Realty* section in Table 2-2).

Effects under Alternative D

Under Alternative D, the BLM would not specifically manage lands to protect wilderness characteristics. The BLM would consider 2,400 acres as suitable or available for disposal and would petition 76,000 acres for withdrawal from mineral entry. The BLM would also manage 184,600 acres as ROW avoidance. Impacts would be similar to Alternative A, but to a lesser degree because more acres would be petitioned for withdrawal from mineral entry and managed as ROW avoidance.

Effects under Alternative E

Under Alternative E, the BLM would manage lands to protect wilderness characteristics. Under The BLM would consider 2,400 acres as suitable or available for disposal and would petition 76,900 acres for withdrawal from mineral entry. The BLM would manage 361,500 acres as ROW avoidance. Impacts would be similar to Alternative A, but to a lesser degree because more acres would be petitioned for withdrawal from mineral entry and managed as ROW avoidance. Also, any new ROWs and maintenance of existing facilities would be evaluated and allowed only under certain circumstances (see *Lands and Realty* section in Table 2-2).

Lands with Wilderness Characteristics: Effects from Renewable Energy*Effects Common to All Alternatives*

Impacts on wilderness characteristics could occur with issuance of new ROWs, which require vegetation clearing and access roads and would increase human presence, machinery, noise, weed potential, and habitat fragmentation. This would degrade wilderness characteristics over the long term. BMPs, stipulations, and mitigation measures such as ROW exclusion and avoidance areas would be implemented to minimize impacts.

Effects under Alternative A

Under Alternative A, the BLM would not specifically manage lands to protect wilderness characteristics. Under Alternative A, 39,800 acres of solar variance areas within the inventoried lands with wilderness characteristics areas would allow the potential for solar development to occur. If developed, apparent

naturalness and opportunities for solitude and primitive recreation would be impacted from increased human occupancy and surface disturbance during construction of facilities. Existing ROW exclusion and avoidance areas in the CCD would protect and limit disturbances to vegetation and prevent noxious and invasive weeds from spreading caused by development.

Effects under Alternative B

Under Alternative B, the BLM would not specifically manage lands to protect wilderness characteristics. Under Alternative B, the BLM would manage 26,800 acres of solar variance areas and 204,800 acres of ROW avoidance areas for wind development on inventoried lands with wilderness characteristics areas. Impacts would be similar to Alternative A, but less in degree because more acres would be managed specifically as ROW avoidance for wind development.

Effects under Alternative C

Under Alternative C, the BLM would manage lands to protect wilderness characteristics. The BLM would manage 292,900 acres as ROW exclusion for wind development. These exclusion areas would provide the most protection to wilderness characteristics out of all alternatives.

Effects under Alternative D

Under Alternative D, the BLM would not specifically manage lands to protect wilderness characteristics. The BLM would manage 23,400 acres of solar variance areas and 98,700 acres of ROW avoidance for wind development. Impacts would be similar to Alternative B, but slightly less because fewer acres would be managed as solar variance areas.

Effects under Alternative E

Under Alternative E, the BLM would manage lands to protect wilderness characteristics. The BLM would manage 85,400 acres as ROW exclusion areas for wind development. Impacts would be similar to Alternative C, but less protective because fewer acres would be managed as ROW exclusion for wind development.

Lands with Wilderness Characteristics: Effects from ACECs

Effects Common to All Alternatives

Where ACEC and lands inventoried for wilderness characteristics overlap, ACEC management could indirectly protect wilderness characteristics due to the protective measures proposed for the ACECs, which are complementary to management objectives for lands with wilderness characteristics. ACEC management would offer some indirect protection of apparent naturalness and outstanding opportunities for solitude and primitive recreation should the ACEC overlap any of the inventoried areas, even if it will not be managed directly for lands with wilderness characteristics.

Effects under Alternative A

Under Alternative A, the BLM would not specifically manage lands to protect wilderness characteristics. A total of 9,200 acres of ACECs would overlap the areas inventoried for lands with wilderness characteristics. Impacts would be the same as those described in *Effects Common to All Alternatives*, but to a lesser degree than all other alternatives due to the relatively few acres of overlap.

Effects under Alternative B

Under Alternative B, the BLM would not specifically manage lands to protect wilderness characteristics. A total of 76,100 acres of ACECs would overlap the areas inventoried for lands with wilderness characteristics. Impacts would be the same as those described in *Effects Common to All Alternatives*, but to a higher degree than most alternatives due to the number of acres that overlap with ACECs.

Effects under Alternative C

Under Alternative C, the BLM would manage lands to protect wilderness characteristics. A total of 89,800 acres of ACECs would overlap the areas inventoried for lands with wilderness characteristics. Impacts would be the same as those described in *Effects Common to All Alternatives*, but to a higher degree than other alternatives due to the number of acres that overlap with ACECs.

Effects under Alternative D

Under Alternative D, the BLM would not specifically manage lands to protect wilderness characteristics. A total of 6,000 acres of ACECs would overlap the areas inventoried for lands with wilderness characteristics. Impacts would be the same as those described in *Effects under Alternative A*, but to a slightly greater degree due to the number of acres that overlap with ACECs.

Effects under Alternative E

Under Alternative E, the BLM would manage lands to protect wilderness characteristics. A total of 13,900 acres of ACECs would overlap the areas inventoried for lands with wilderness characteristics. Impacts would be the same as those described in *Effects under Alternative D*.

Lands with Wilderness Characteristics: Cumulative Effects

Past and Present Actions

No past impacts have occurred from any resources or resource uses due to the relatively new identification of lands with wilderness characteristics within the CCD.

Reasonably Foreseeable Actions

Development from minerals, renewable energy, and lands and realty projects are most likely to impact the indicators for lands with wilderness characteristics due to the surface disturbance and facility development associated with these resource uses.

Incremental Cumulative Impact – Combined Past, Present, Reasonably Foreseeable Future Actions – All Alternatives

Incremental impacts would be dependent to the amount of minerals, renewable energy, and ROWs development within land with wilderness characteristics. Overall impacts would remain low mainly from avoidance and exclusion restrictions in areas that were inventoried for lands with wilderness characteristics. Areas to be managed specifically for wilderness characteristics under Alternative C would be on 416,500 acres within 12 units and under Alternative E there would be 332,600 acres within 8 of the inventoried units.

4.3.13 Caves and Cave Resources

This section discusses effects on caves and cave resources from proposed management actions of other resources and resource uses. Existing conditions concerning caves and cave resources are described in **Section 3.2.13, Caves and Cave Resources**.

Caves within the planning area have significance due to bat habitat, prehistoric use, or the presence of artifacts and pictographs as well as spiritual and traditional uses and purposes by local tribes. Cave and rock areas provide day and night roosting habitat for bat species and are important elements in supporting the sensitive species in the planning area. Cave features also provide opportunities for recreation. Interpretive tours of Hidden Cave and Dynamite cave and surrounding area have been provided for 30 years, and in 2010, over 1,300 people were provided tours of Hidden Cave by BLM interpretive specialists and the Churchill County Museum.

Summary

The geologic setting of the planning area consists of granitic and metamorphic rocks that are overlain by volcanic and sedimentary rocks, so there is little opportunity for the formation of large or extensive cave systems. The majority of the caves in the planning area consist of undercut rock shelters and shallow cavities in basalt or rhyolite rock that were formed by wave action from ancient Lake Lahontan approximately 21,000 years ago.

There are several named and unnamed caves in the planning area. Caves with cultural significance exist but have not been identified or mapped in a single database, or the caves are proprietary in nature and the locations are documented only in cultural files as a means to protect the resource. Natural caves suitable for supporting biota such as bats are scattered throughout the planning area, but minimal mapping or identification has occurred for this resource as well.

Caves are managed under the Federal Cave Resources Protection Act (CRPA), Sec. 3(1) of 1988. The purpose of CRPA is to secure, protect, and preserve significant caves on federal lands for the perpetual use, enjoyment, and benefit of all people and to foster increased cooperation and exchange of information between governmental authorities and those who utilize caves located on

federal lands for scientific, education, or recreational purposes. With the Act, Congress established policy that federal lands be managed in a manner that protects and maintains, to the extent practical, significant caves, and cave resources.

Overall, objectives and actions associated with other resources that result in closure to surface disturbance activities would result in beneficial impacts on any caves that might be present due to a reduce risk for disturbance of the cave. Management for the following resources would not result in an effect on caves and cave resources: air quality, climate, soil and water resources, vegetation, wild horses and burros, wildland fire management, visual resources, forest and woodland products, ACECs, Back Country Byways, national trails, WSRs, BCWCAs, and WSAs.

Methods of Analysis

Methods and Assumptions

Caves and cave resources baseline information in **Section 3.2.12**, Caves and Cave Resources, was reviewed for current understanding of known resources and to determine the condition of the resources. Also, all laws pertinent to determining effects on caves and cave resources (e.g., Federal Cave Resources Protection Act [CRPA]) were considered and included in criteria for determining impacts. This known information was overlain with the actions found under each alternative in Chapter 2, and conclusions were drawn based on an understanding of how these types of actions may affect known and potentially discoverable resources.

The following assumptions regarding the resource base and management practices were considered in the analysis:

- Education of the public increases support for protection of caves and bats, but also increases visitation.
- Damage, theft, and vandalism is likely to increase with increased visitation.
- The bats that might live in caves could be impacted by vandalism, noise from visitors, and litter.
- Cave resource protection and mitigation measures apply to all proposed federal or federally assisted undertakings, and will be applied at project design and implementation phases.

Indicators

The following indicators were used to assess the degree of impacts on cave resources:

- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the cave resources
- Loss of integrity, and in some cases a loss of archeological information resulting from physical damage or destruction of all or parts of a cave
- Health of biological communities of cave resources
- Alterations to the level of public access to cave resources, which may result in increased use, erosion, bat disturbance and abandonment, looting, and vandalism
- A lack of action, which, in certain cases, can allow a cave resource to deteriorate

Nature and Type of Effects

Impacts on caves occur by excavation, theft, vandalism, and disturbance to biological resources. Typically, disturbance, damage, theft, and vandalism occurrence to caves are concentrated near roads and trails. Impacts on cave resources may increase with additional visitation to areas within the planning area.

Cave Resources: Effects from Fish and Wildlife Management

Effects Common to All Alternatives

Fish and wildlife management encompasses management of wildlife habitat, big game species, migratory bird corridors and Important Bird Areas, and active raptor nest sites. Management actions would impose surface restrictions that vary by management objectives, habitat type, and Alternative. These surface use restrictions, if within the vicinity of cave resources, would protect these caves from damage or impact from surface disturbing activities, but these effects are essentially common to all alternatives.

Fish and wildlife management would also provide actions and management objections for bats and bat habitat. This would directly affect caves, and would vary by alternative.

Effects under Alternative A

Alternative A would not provide additional or new guidelines for the management or protection of bat habitat, and would therefore not result in any additional protection of caves and their resources.

Effects under Alternative B

Alternatives B through E would require bat gates for the closure of caves and abandoned mine lands where caverniculous bat roosting, maternity sites, and winter hibernacula occur. Installation of bat gates would be temporarily disturbing to cave resources as research, documentation of resources, and

construction of the gate occur, but would afterwards protect these cave resources from public intrusion, theft, or vandalism.

Alternative B would also inventory for bats and bat habitat usage before allowing surface disturbing activities within 0.25 miles of caves not known to be occupied by bats. This would reduce the potential for disturbance to these caves from surface disturbing activities or increased visitor use related to the surface disturbing activity.

Effects under Alternative C

Alternative C would be similar to Alternative B in respect to bat gates. In addition, Alternative C would provide for bat gate closures at the entrance of all caves to protect important bat habitat and to minimize potential impacts on roosting bats.

Alternative C would inventory for bats and bat habitat usage before surface disturbing activities within 0.5 miles of caves not known to be occupied by bats, and would prohibit large-scale surface disturbing discretionary actions within 500 feet of bat occupied caves. This would reduce possibility of impacts on cave features in these caves. These surface restrictions and inventory requirement would provide greater protection to caves and their resources than Alternative A.

Effects under Alternative D

Alternative D would be the same as Alternative B in respect to bat gate implementation.

Like Alternative B Alternative D would require an inventory for bats and bat habitat usage in caves not known to be occupied by bats within 0.25 miles of proposed surface disturbing activities. Additionally, Alternative D would prohibit large-scale surface disturbing discretionary actions within 200 feet of bat occupied caves. This would reduce the possibility of impacts on caves and their resources more than Alternative A and B, but less than Alternative C.

Effects under Alternative E

Alternative E would be the same as Alternative B in respect to bat gate implementation.

Like Alternatives B and D, Alternative E would require an inventory for bats and bat habitat usage in caves not known to be occupied by bats within 0.25 miles of proposed surface disturbing activities. Alternative E would also prohibit large-scale surface-disturbing discretionary actions within 0.5 miles of bat occupied caves, which is the largest buffer of all the alternatives, and would therefore provide the most protections of caves and cave features that are occupied by bats.

Cave Resources: Effects from Special Status Species Management

Effects Common to All Alternatives

Measures to protect special status fish, wildlife, and wildlife habitat include a variety of restrictions, buffers, closures, height limits, and bat gates that would limit activities that are incompatible with maintaining special status species. These actions could indirectly reduce the potential for disturbance of caves and their associated resources through land use restrictions.

Effects under Alternative A

Management of special status species under Alternative A would not provide for any additional land use restrictions that would reduce the possibility of impacts on cave resources.

Effects under Alternative B

Greater Sage-Grouse

Greater Sage-Grouse habitat management would manage PPMA (275,600 acres) with CSU stipulations for fluid mineral leasing and as ROW avoidance areas.

Effects under Alternative C

Greater Sage-Grouse:

Alternative C would close PPMA and PGMA (414,200 acres) to fluid mineral leasing, nonenergy mineral leasing, and mineral material disposal. In addition, the BLM would manage these areas as ROW exclusion areas. Alternative C would implement the most restrictions on Greater Sage-Grouse habitat, and would therefore be the most protective of cave resources within these areas.

Effects under Alternative D

Greater Sage-Grouse:

Under Alternative D Greater Sage-Grouse habitat management would apply NSO stipulations for fluid mineral leasing within PPMA (275,600 acres) with no exceptions, modifications, or waivers. Alternative D would apply NSO stipulations for fluid mineral leasing within PGMA (138,600 acres) with exceptions, modifications, and waivers as outlined in **Appendix C**, and would manage PPMA and PGMA as ROW avoidance areas (414,200 acres). These restrictions are greater than Alternative A.

Effects under Alternative E

Greater Sage-Grouse:

Greater Sage-Grouse habitat management under Alternative E would be similar to those described under Alternative D. In addition to the management actions under Alternative D, Alternative E would close PPMA and PGMA to nonenergy

mineral leasing and mineral material disposal. Alternative E would be more protective of cave resources than Alternative A.

Cave Resources: Effects from Cultural Resources Management

Effects Common to All Alternatives

There are potentially more caves in the planning area that may contain cultural resources. If so, the BLM would manage these resources under the cultural resources program, in accordance with the cultural resource management objectives and actions. The effects of management of Hidden Cave and Dynamite Cave, which do contain cultural resources, are discussed under Effects from Cave Resources Management.

Unless a cave contains cultural resources, there likely would be no impacts on cave resources resulting from cultural resource management objectives or actions under any of the alternatives. With respect to effects on cave resources, all of the alternatives are essentially equivalent.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Cave Resources: Effects from Paleontological Resources Management

Effects Common to All Alternatives

Any caves yet to be discovered could contain paleontological resources. If so, the BLM would manage these resources under the paleontological resources program, in accordance with the paleontological resource management objectives and actions.

Unless a cave contains paleontological resources, there likely would be no impacts on caves and cave resources resulting from paleontological resources management objectives or actions under any of the alternatives.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Cave Resources: Effects from Caves and Cave Resource Management

Effects Common to All Alternatives

Under all alternatives significant cave resources would be protected for educational, scientific, and recreational values. Additional significant caves, if there are any, would be identified in accordance with 43 CFR Part 37, added to the currently maintained list of designated significant caves, and managed according to all federal and state laws and regulations. Caves with no previous bat inventories will be evaluated for their potential value as bat habitat in coordination with state and federal wildlife agencies.

Under all alternatives, 10 caves would be designated as having significant cultural, biological, educational, or scientific resources. In no order, these caves are: Hidden Cave, Burnt Cave, Cowboy Cave, Fish Cave, Eastgate Shelter, Picnic Cave, Salt Cave, Spirit Cave, Dynamite Cave, Topia Cave. Other caves could be designated as identified. Of these, Hidden Cave and Dynamite Cave will have specific management actions under the alternatives to protect their cultural and biological resources. Burnt Cave and Picnic Cave are two rock shelters located next to Hidden Cave, and would benefit from management actions pertaining to Hidden Cave.

Effects under Alternative A

Alternative A would continue to manage significant caves based on current land use plan decisions, policy, and regulations. Limited or outdated protections for significant cave resources could result in a limited capacity to protect cave resources from irreparable damage from theft, vandalism, or conflicting resource use.

Alternative A would not limit ROW or mineral development near Hidden Cave or Dynamite Cave, and would therefore be the least protective of these caves of all the alternatives.

Effects under Alternative B

Under Alternative B, BLM would develop a public education and outreach program to foster an appreciation for caves and their associated resources, and

would provide staff or a site steward to monitor caves identified as culturally significant and heavily used by the public. Implementation of public awareness of significant caves and their resources and added security would reduce the likelihood of theft, vandalism, or defacing of the caves.

Alternative B would manage Dynamite Cave as having significant cultural resources and would protect these by implementing a 0.25-mile ROW avoidance area around the cave, closing the cave to mineral material disposals, and applying for a 500-foot CSU stipulation for fluid mineral leasing.

Alternative B would manage Hidden Cave as having significant cultural resources and would protect these by implementing a 500-foot ROW avoidance buffer around the cave, closing the area to mineral material disposal, and applying CSU stipulations within 500 feet of the cave for fluid mineral leasing.

Due to these additional measures, management of caves and cave resources under Alternative B would be more protective than Alternative A.

Effects under Alternative C

Like Alternative B, BLM would develop a public outreach and education program to foster an appreciation for caves and their cultural resources under Alternative C. Additionally, BLM would provide staff, law enforcement, or volunteer site stewards to monitor caves identified as culturally significant and heavily used by the public. Implementation of public awareness of significant caves and added security around them would reduce the likelihood of theft vandalism of the cultural resources associated with the caves.

Alternative C would also include significant caves in the fuels-treatment program to reduce risk of fire and increase protections of sensitive cultural resources that may be impacted by a high-fuels load.

Alternative C would manage Dynamite Cave as having significant biological and cultural resources, and would protect these by implementing a 0.5-mile ROW exclusion buffer around the cave, closing the area to mineral material disposal and fluid mineral leasing, recommending the area for withdrawal from locatable mineral entry, and closing the area to motorized travel within 500 feet of the cave.

Alternative C would manage Hidden Cave as having significant cultural resources and would protect these by implementing a 500-foot ROW exclusion a buffer around the cave, closing the area to fluid mineral leasing and mineral material disposal, recommending the area for withdraw from locatable mineral entry, and closing the area to motorized travel within 500 feet of the cave.

Alternative C is similar to Alternatives B and D, but with greater restrictions in respect to ROW exclusion, mineral closures, travel management designations,

and fuels-treatments. Alternative C would be more protective of significant caves and their resources than the other Alternatives.

Effects under Alternative D

Like Alternatives B and C, Alternative D would develop public outreach programs to foster an appreciation for caves and their cultural resources, and provide staff to monitor caves identified as culturally significant and heavily used by the public. Like Alternative C, Alternative D includes culturally significant caves in the fuels-treatment program to protect sensitive attributes that may be impacted by a high-fuels load. Unlike the other Alternatives, Alternative D would also protect cultural resources associated with caves from vandalism or theft by installing gates, security fencing and signs near urban or developed areas in effort to protect human health and safety.

Specific management of Hidden Cave and Dynamite Cave under Alternative D would be the same as Alternative B. These measures would be more protective of significant caves than Alternative A.

Effects under Alternative E

General outreach and protection of significant caves under Alternative E would be similar to Alternative C.

Alternative E would manage Dynamite Cave as having significant bat and cultural resources and would protect these by implementing the same restrictions to ROW and mineral development and to motorized travel as Alternative C would.

Management of Hidden Cave under Alternative E would be the same as management of the Cave under Alternative B, with the addition of increasing public education and interpretation, and archaeological investigation and reinvestigation of the Cave.

Management of significant caves under Alternative E would be more protective of the caves and their associated resources than Alternative A, but less protective than Alternative C would be, due to less closure to mineral resources and travel management around Hidden Cave than Alternative C would provide.

Cave Resources: Effects from Livestock Grazing Management

Effects Common to All Alternatives

Caves and their associated resources within the planning area that are not identified for specific management, are not protected or blocked from surface disturbing activities, or are not gated to protect bat habitat, may be at risk for damage from livestock seeking shelter within the cave. These effects would be mitigated at the planning level with closures or restrictions on livestock grazing.

On a case-by-case basis, newly identified caves would be mitigated to prevent undue degradation to significant caves resources.

Effects under Alternative A

Under Alternative A, 6,700 acres would not be available for livestock grazing. This is the least restrictive among the alternatives; therefore, the potential effects from livestock grazing on cave resources could occur over the largest area.

Effects under Alternative B

Under Alternative B, the BLM would manage 6,100 acres as not available for livestock grazing. This alternative makes slightly fewer acres available for grazing than under Alternative A.

Effects under Alternative C

Under Alternative C, 2,702,000 acres would not be available for livestock grazing. This is much more restrictive than Alternative A and would substantially reduce grazing-associated impacts.

Effects under Alternative D

Alternative D would manage 10,700 acres as not available for livestock grazing, which is greater than Alternative A, but impacts would only be slightly reduced compared to Alternative A.

Effects under Alternative E

Alternative D would manage 6,100 acres as not available for livestock grazing. The impacts would be the same as those described for Alternative B.

Cave Resources: Effects from Geology and Mineral Management

Effects Common to All Alternatives

If caves are present where mining occurs, these resources could be impacted by the extent and depth of ground disturbance associated with salable and locatable mineral development. Drilling activities could intersect with undiscovered caves or lava tubes. While none of the known caves in the planning area contain mineral resources, yet to be discovered caves might contain cave specific deposits (e.g., crystals and sheet flows). If so, the BLM would manage these areas on a case-by-case basis in coordination with the minerals resources program objectives and actions, which include some restrictions on mining operations near caves.

Restrictions for mineral development by alternatives are discussed under Cave Resources: Effects from Cave Resources, and requirements for bat inventory are discussed under Cave Resources: Effects from Wildlife Management.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Cave Resources: Effects from Recreation and Visitor Services

Effects Common to All Alternatives

Designation of SRMAs and ERMAs could increase visitor use, however, specific management actions for these areas would also provide protection of resources. Increased recreation, visitation, and recreation may result in the exploration and discovery of cave resources, and in the negative effects of tampering with undocumented cave resources, or theft or vandalism of the resources. This would result in the loss of nonrenewable scientific data.

Effects under Alternative A

Summary

Alternative A would designate 67,700 acres under two SRMAs for intensive recreational uses, which may increase the potential for new cave discoveries in these areas.

Effects under Alternative B

In total, Alternative B would designate 1,754,400 acres in 14 areas for intensive recreational use. This would increase the likelihood of new cave discovery over Alternative A, which would designate fewer acres in fewer areas.

Effects under Alternative C

In total Alternative C would designate 1,603,500 acres in 18 areas for recreation use. This would increase the likelihood of new cave discovery in 18 areas, which is greater than Alternative A.

Effects under Alternative D

SRMAs

Alternative D would designate 4 SRMAs totaling 67,100 acres, including Alpine (7,400 acres), Dead Camel Mountain (37,400 acres), Hungry Valley (21,800 acres), and Wilson Canyon (500 acres).

Alternative D would designate more SRMAs than Alternative A. Alternative D would manage the fewest acres as SRMAs of the alternatives.

ERMAs

Alternative D would designate 6 ERMAs totaling 292,600 acres. These ERMAs include Faye-Luther (600 acres), Mustang (400 acres), Pah Rah (20,000 acres), Pine Nut (201,100 acres), Reno Urban Interface (70,400 acres), and 102 Ranch (120 acres).

Alternative D would designate more ERMAs than Alternative A. Alternative D would manage more acres as ERMAs than Alternative A.

Summary

Alternative D would manage a total of 359,700 acres in 10 areas for intensive recreation use. Alternative D would manage the fewest acres as SRMA or ERMAs. This would result in a lowered potential for new cave discovery in comparison to the other alternatives. However, Alternate A would manage the fewest areas for intensive recreation use. This would result in the lowest potential for new cave discovery.

Effects under Alternative E

SRMAs

Alternative E would designate 6 SRMAs totaling 106,100 acres including Alpine (7,700 acres), Dead Camel Mountain (37,400 acres), Hungry Valley (16,200 acres), Sand Mountain (19,700 acres), Walker Lake (24,600 acres), and Wilson Canyon (500 acres).

Alternative E would designate the same number of SRMAs as Alternative B would, and more than Alternative A. Alternative E would manage the most acres as SRMAs of the alternatives.

ERMAs

Alternative E would designate 15 ERMAs totaling 2,085,800 acres. These ERMAs include Bagley Valley (2,600 acres), Dry Valley (83,000 Acres), Faye-Luther (110 acres), Middlegate (268,700 acres), Mina (824,700 acres), Mustang (400 acres), Pah Rah (20,000 acres), Petersen (42,000 acres) Pine Nut (201,000 acres), Reno Urban Interface (70,600 acres), Salt Wells (280,400 acres), Singatse (174,900 acres), Virginia Mountains (68,100 acres), Virginia Range (48,800 acres) and 102 Ranch (120 acres).

Alternative E would designate the same number of ERMAs as Alternative C, and more than Alternative A. Alternative E would manage the most acreage as ERMAs of the alternatives.

Summary

Alternative E would designate 2,191,900 acres in 24 areas for intensive recreation. Alternative E would provide the highest opportunity for new cave discovery of all the alternatives, and therefore the highest risk for damage of caves and their resources.

Cave Resources: Effects from Comprehensive Travel and Transportation Management

Effects Common to All Alternatives

Travel management designations could open, limit, or close roads that would provide access to cave resources, or would provide access to the vicinity of cave resources which may result in their unintended discovery and potential misuse.

Effects under Alternative A

Alternative A would manage 3,840,300 acres as open to cross-country travel, 31,800 acres as closed to motorized and mechanized travel, 6,900 acres as closed to motorized travel with mechanized travel limited to existing routes, and 924,300 acres as limited to existing roads for motorized travel for a total of 963,000 acres of restrictions.

Alternative A would managed more acres closed to motorized and mechanized travel than Alternatives B, D, and E, and less than Alternative C. Alternative A would manage more acres as closed to motorized travel with mechanized travel limited to existing routes than Alternatives B, D, and E, but less than Alternative C. Alternative A would manage the fewest acres as limited to existing routes for motorized and mechanized travel than all of the alternatives. Overall, Alternative A would place the fewest restrictions on travel management of the alternatives.

Effects under Alternative B

Alternative B would manage 95,300 acres as open to cross-country travel, 26,700 acres as closed to motorized and mechanized travel, and 4,300 acres as closed to motorized travel with mechanized travel limited to existing routes, and 4,677,000 acres as limited to existing roads for motorized travel.

Alternative B would manage fewer acres as closed to motorized and mechanized travel than Alternative A. Alternative B would manage fewer acres as closed to motorized travel, with mechanized travel limited to existing routes than Alternative A. Alternative B would manage more acres as limited to existing routes for motorized and mechanized travel than Alternative A. Overall, Alternative B would manage more acres with restrictions than Alternative A.

Effects under Alternative C

Alternative C would manage 1,300 acres as open to cross-country travel, 1,190,500 acres as closed to motorized and mechanized travel, 598,000 acres as

closed to motorized travel with mechanized travel limited to existing routes, and 3,013,500 acres as limited to existing roads for motorized travel.

Alternative C would manage the most acres as closed to motorized and mechanized travel of all the alternatives. Alternative C would also manage the most acres as closed to motorized travel with mechanized travel limited to existing routes. Alternative C would manage more acres as limited to existing routes for motorized and mechanized travel than Alternative A. Alternative C would place the most restrictions on travel management of all the alternatives.

Effects under Alternative D

Alternative D would manage 22,700 acres as open to cross-country travel, 30,600 acres as closed to motorized and mechanized travel, 1,600 acres as closed to motorized travel with mechanized travel limited to existing routes, and 4,748,400 acres as limited to existing roads for motorized travel

Alternative D would manage fewer acres as closed to motorized and mechanized travel than Alternative A. Alternative D would manage the fewest acres as closed to motorized travel, with mechanized travel limited to existing routes of all the alternatives, and more acres as limited to existing routes for motorized and mechanized travel than all the alternatives. Overall, Alternative D would manage more acres with restrictions than Alternative A.

Effects under Alternative E

Alternative E would manage 55,700 acres as open to cross-country travel, 24,100 acres as closed to motorized and mechanized travel, 6,200 acres as closed to motorized travel with mechanized travel limited to existing routes, and 4,717,300 acres as limited to existing roads for motorized travel.

Alternative E would manage the fewest acres as closed to motorized and mechanized travel of all the alternatives. Alternative E would manage fewer acres as closed to motorized travel, with mechanized travel limited to existing routes than Alternative A. Alternative E would manage more acres as limited to existing routes for motorized and mechanized travel than Alternative A. Overall, Alternative E would manage more acres with restrictions than Alternative A.

Cave Resources: Effects from Lands and Realty

Effects Common to All Alternatives

Granting ROW access in areas that do not currently have ROW access could result in unintended cave discovers, and may result in misuse of the cave and cave resources. Areas that are limited or closed to ROW entry would result in protection of cave resources.

Effects under Alternative A

Alternative A would manage 564,100 acres as ROW exclusion, and would not manage any acres as ROW avoidance. Land Use Authorizations and

management under Alternative A would provide the least protection for cave resources.

Effects under Alternative B

Alternative B would manage 580,000 acres as ROW exclusion and 1,195,800 acres as ROW avoidance, totaling 1,775,800 acres of land restriction that would provide protection of cave resources. This is more than Alternative A.

Effects under Alternative C

Alternative C would manage 2,675,800 acres as ROW exclusion and 369,300 acres as ROW avoidance totaling 3,045,100 acres of land restriction. This would provide the most protections of cave resources from potential impacts for lands and realty development.

Effects under Alternative D

Alternative D would manage 564,100 acres as ROW exclusion and 1,226,100 acres as ROW avoidance, totaling 1,790,200 acres of land use restriction that would protect cave resources. This is more than Alternative A.

Effects under Alternative E

Alternative E would manage 605,900 acres as ROW exclusion and 1,448,200 acres as ROW avoidance totaling 2,054,100 acres of land restrictions that would prevent impacts on cave resources. This is more than Alternative A.

Cave Resources: Effects from Renewable Energy

Effects Common to All Alternatives

Potential impacts from renewable energy projects (e.g., solar, wind, and biomass) include direct impacts from ground-disturbing activities, erosion, and indirect impacts from intrusions to setting, and access, leading to unauthorized collection or vandalism. The siting of wind energy facilities could affect the visual setting of historic trails and other cultural resources. All permits and ROWs would be subject to stipulations, restrictions, and mitigation measures. This would reduce the potential for impacts on cultural resources. Under all alternatives the development of renewable energy in a timely manner to meet national, regional, and local needs would be encouraged.

Effects under Alternative A

Alternative A would manage 905,900 acres as variance areas for utility-scale solar development, and would not manage any acres as ROW avoidance or exclusion areas for wind energy projects.

Effects under Alternative B

Alternative B would manage 773,400 acres as variance areas for utility-scale solar development, and would manage 1,220,200 acres as ROW avoidance for wind energy projects. Alternative B would manage 1,993,600 acres with restrictions on renewable energy development. This would be more than Alternative A.

Effects under Alternative C

Alternative C would manage 578,400 acres as variance areas for utility-scale solar development, and 2,073,200 acres as ROW exclusion areas for wind energy projects, including 14,700 acres in the Virginia City National Landmark Historic District ACEC. This would reduce the potential for impacts on cave resources the most of all the alternatives.

Effects under Alternative D

Alternative D would manage 672,100 acres as variance areas for utility-scale solar energy, and 1,228,100 acres as ROW avoidance areas for wind energy projects. This would be a total of 1,900,200 acres managed with restrictions on renewable energy development. This would be more than Alternative A.

Effects under Alternative E

Alternative E would manage 629,900 acres as variance areas for utility-scale solar energy, 956,900 acres as ROW avoidance areas, and 629,900 acres as ROW exclusion areas for wind energy projects. This would be a total of 2,216,700 acres managed with restrictions on renewable energy. This would be more than Alternative A.

Cave Resources: Cumulative Effects

Table 4-1 lists the reasonably foreseeable cumulative actions for the CCD.

Special status species management has included management actions that protect caves resources by restricting human access, utilizing land use restrictions, and to protect bats. Generally, habitat improvement projects to protect bats and bat habitat by gating protect cave resources and any significant features associated with the cave. Managing to protect and rehabilitate wildlife and sensitive species habitat will continue.

Past and present impacts resulting from livestock grazing has generated no known impacts on significant cave resources but cattle have been known to seek out shallow caves for shelter. There have also been few known impacts from minerals, lands and realty, and renewable energy developments, although these developments may increase the potential for cave discovery and exploration. Activities associated with minerals, lands and realty, and renewable energy developments would increase the number of facilities, roads, and other disturbances that may directly impact caves. Based on implementation of land use plan goals, objectives, and management actions, disturbance near these features would be limited.

Increase demand for recreation as population grows could put known and unknown cave resources at risk due to ease of access from further development of ROWs, mineral resources, and SRMAs and ERMAs. Recreation use from caving has damaged some cave features due to removal or vandalism. These impacts would be reduced based on implementing public outreach and education, seasonal closures, installation of bat gates, and other mitigation measures.

4.4 RESOURCES USES

This section contains a description of impacts on the human uses of resources in the Planning Area and follows the order of topics addressed in Chapter 2:

- Forestry and Woodland Products
- Livestock Grazing
- Geology and Minerals (locatable, salable, and leasable [excluding geothermal])
- Recreation and Visitor Services
- Comprehensive Travel and Transportation Management Lands and Realty
- Renewable Energy

4.4.1 Forestry and Woodland Products

Summary

Forested vegetation would be directly affected most by fire management and forest vegetation management. Restrictions on management activities to protect other resources, primarily cultural, visual, and special status species, would indirectly affect the level, location, and effectiveness of forest management actions to improve forest health. Effects from other resources would be limited and localized. Forest and woodland product utilization results in additional impacts to those analyzed under the vegetation section.

From the standpoint of managing forest stands to maintain forest health or improve wildlife habitat, Alternative C would provide the greatest benefit, followed by Alternatives E, D, A, and then B. All alternatives would allow for managing forest stands for stand health and vigor. Multiple uses would be emphasized the most in Alternative B, followed by Alternatives E, D, A, and C.

Management for the following resources would not result in an effect on forest and woodland products: air quality, caves and cave resources, Back Country Byways, national trails, WSRs, WSAs, back country wildlife conservation areas, public health and safety.

Methods of Analysis

Methods and Assumptions

Impacts are determined by assessing which actions, if any, would change vegetation structure or composition, decrease the extent of forests, allow for increased dominance of invasive weeds, affect habitat value for wildlife species, or decrease the potential for multiple use.

Direct impacts on forest and woodland resources from product utilization include removal of wood, plants, and seeds, creation of roads or trails by

equipment, increased traffic on roads from the transport of products, potential introduction of invasive or noxious weeds, spread of invasive or noxious weeds by equipment or foot traffic, trampling of understory vegetation, and soil compaction. Indirect effects include the potential for increased spread of invasive or noxious weeds (colonization of bare mineral soil), reduced regeneration rates where seed material has been removed, and increased abundance and vigor of native understory vegetation.

The effects of each action on forest and woodland vegetation resources are quantified when possible, but many impacts must be qualitatively assessed when suitable data are not available. The following assumptions were made for this analysis:

- Current trends in plant succession and vegetation will continue.
- Noxious and invasive weeds will continue to be introduced and will spread as a result of ongoing vehicle traffic in and out of the planning area, recreational activities, wildlife and livestock grazing and their movements, and surface-disturbing activities.
- Noxious and invasive weeds will further expand into native plant communities, and disturbances to these communities will create opportunities for the spread of nonnative invasive plant species.
- Many actions that occur within the planning area will be subject to BMPs. Although BMPs are designed to minimize the effects of projects, they generally cannot eliminate all impacts. This impact analysis assumes that BMPs will minimize but not eliminate possible effects.

Indicators

The following indicators were used to assess the degree of impacts on forest resources:

- Acres of forest lost or restored
- Forest Health Indicators – Forest stand die-off areas, presence of insect infestations and pathogens, and conditions relating to drought.

Nature and Type of Effects

The nature and type of effects vary by resource and alternative as described in the following sections.

Forestry and Woodland Products: Effects from Climate Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

The BLM would continue climate management by implementing site-specific management actions response to degradation of areas from drought conditions.

Effects under Alternative B

Under Alternative B, the BLM would consider current and potential climate change induced threats to BLM special status species and ecosystems functions. Treatments would be implemented to remove existing threats that may exacerbate the negative effects of climate change on BLM special status species and ecosystem functions. Climate change impacts would be considered in project approval and funding, and specialists would use adaptive management in considering climate change in project design and operation. A Rapid Ecological Assessment would be employed to assess impacts of climate change and maintain connectivity. These approaches would increase the ability of BLM management to respond to climate change. Adaptive management for climate change would improve management of forest resources.

Effects under Alternative C

Effects under Alternative C would be similar to those described under Alternative B, however steps would be taken to conserve habitat to ensure adequate conditions.

Effects under Alternative D

Effects under Alternative D would be similar to those described under Alternative B. Management under Alternative D would develop proactive steps that can be taken to mitigate the effects of climate change on BLM special status species and unique plant assemblages through community workshops, tribal consultations, and other organizations. Impacts from climate change would be addressed across administrative boundaries and would be more effective on a regional scale.

Effects under Alternative E

Effects under Alternative E would be the same as under Alternative D.

Forestry and Woodland Products: Effects from Soil Resources

Effects Common to All Alternatives

Soil erosion reduction measures, involving seeding and improving vegetative cover, would reduce compaction and increase infiltration. This would indirectly improve forest health and habitat value. These changes could lead to increased vegetative productivity and improved wildlife habitat and connectivity. Increased vegetation productivity will provide for a sustained yield of forest and woodland products. All alternatives would restrict surface disturbing activities on steep slopes and highly erosive areas, would prevent harvesting of trees in these areas, resulting in a reduction of the total available products. Since all alternatives would provide for the same amount of product removal as current management, this effect is minimal.

Effects under Alternative A

Alternative A would limit OHV use to designated roads and trails in highly erosive soil areas. This approach would protect forested areas not currently used as roads or trails. Limiting OHV to existing roads and trails would reduce access to areas for harvesting or would make harvesting more difficult.

Effects under Alternative B

Alternative B would apply an erosion control plan to projects on slopes, would apply soil amendments to minimize soil disturbance, and would apply CSU stipulations on highly erosive soils. These management approaches would diminish erosion and soil damage and protect forests more than current management. Minimizing soil disturbance may limit access to harvest areas or make harvesting more difficult.

Effects under Alternative C

In addition to the approaches under Alternative B, Alternative C would minimize soil crust breakage by applying litter. These management approaches would protect forests and diminish erosion and soil damage compared to current management but could also restrict woodland harvesting in areas.

Effects under Alternative D

In addition to the approaches under Alternatives B and C, Alternative D would also mandate re-seeding of disturbed soils to minimize erosion. Along with Alternative E, Alternative D includes the most specific actions to reduce soil damage and provide sustainable woodland stands.

Effects under Alternative E

Effects under Alternative E would be similar to those described for Alternative D.

Forestry and Woodland Products: Effects from Water Resources

Effects Common to All Alternatives

Water resource management would improve conditions for forest stands based on implementation of BMPs and standard operating procedures that would reduce erosion.

Effects under Alternative A

Alternative A limits BLM-authorized activities in degrading watersheds and specific portions of urban watersheds at the most immediate risk of degradation, and limits OHV use in riparian areas. These approaches protect water supply in specific localized areas, but provide limited oversight of watershed health and water quality on a regional scale.

Effects under Alternative B

In addition to the efforts under current management, Alternative B and the other action alternatives would establish a listing of priority watersheds and

priority water supply areas based on presence of wildlife habitat, among other factors. These management actions may improve management of water supply for forested areas.

Effects under Alternative C

In addition to the approach under Alternative B, Alternative C would also use permitting, land acquisitions, and other realty actions to acquire minimum pool and in-stream flows or to gain access to water sources or developments. The actions would improve hydrologic function in forested areas, especially riparian forests.

Effects under Alternative D

Effects under Alternative D would be similar to those described for Alternative C.

Effects under Alternative E

Effects under Alternative E would be similar to those described for Alternative C.

Forestry and Woodland Products: Effects from Vegetation Resources

Effects Common to All Alternatives

Implementing strategies to remove or thin pinyon-juniper would protect woodland harvesting areas from wildfire. All alternatives provide for some removal (salvage) of trees after fire allowing for increased availability of some woodland products. Restoring vegetation following a fire would regenerate woodland stands and make them available for woodland harvesting in the long term. Management actions to protect and enhance vegetation would improve forest health and provide for sustainable harvesting of woodland products. Implementing management actions to achieve and manage proper functioning condition of riparian areas would improve woodland stand health within riparian areas. Actions to decrease weeds on BLM-administered lands would indirectly improve forest health and habitat values by increasing native species and decreasing the risk of catastrophic wildfire in both the short term and long term. Wildfire could directly damage or kill stands, further allowing for spread of weeds, and destroy wildlife habitat. Further coordination with agencies and implementation of BMPs would reduce the introduction and spread of weeds.

Vegetation treatments for rangeland improvement projects may reduce the prevalence of invasive species and would directly improve ecological conditions. Such projects would reestablish an understory of forbs and perennial bunchgrasses that are less susceptible to fire than invasive annuals, such as cheatgrass. This would reduce the risk of catastrophic wildfire on rangelands, which might otherwise spread into woodlands.

Improving and maintaining meadows and riparian areas could limit the type of forest treatments that could be used to achieve forest and woodland health and

habitat goals. This could indirectly prevent health and habitat goals from being attained. However, these restrictions are not expected to completely prevent the attainment of these goals over the long term.

Effects under Alternative A

This alternative would allow for the collection of vegetative products to meet personal use and small-scale commercial use. Large-scale product utilization projects (e.g., biomass removal) would be limited and would deter the ability to encourage new markets.

Effects under Alternative B

Management under Alternative B would emphasize the utilization of products from treatments and would allow commercial, biomass, and harvesting within riparian stands. This alternative is designed to meet current and future demand for these products. Management under this alternative would remove trees, causing surface disturbance and fragmentation within harvesting areas affecting forest health and woodland sustainability, resulting in the greatest impacts of any alternative.

Effects under Alternative C

Alternative C would restrict forest and woodland product utilization to personal use, limiting surface disturbance, erosion potential, and tree harvesting while maintaining stand health and sustainability. Alternative C would close riparian areas to woodcutting or any other vegetative removal, except where important for traditional cultural practices identified by Native American tribes or for restoration to benefit riparian values. Woodland products would not be available to commercial users. Limiting commercial activities, including native seed collection, would limit the amount of seed available for use in restoration projects.

Effects under Alternative D

Management under Alternative D would develop strategic plans for vegetation treatments in order to mitigate the impacts of providing the full suite of forest and woodland product utilization. Collection opportunities would be limited until the strategy is prepared, which may cause commercial producers to leave the local market in search of available products. There would be a lag in opportunities to utilize products from restoration activities as these markets would have to be redeveloped. Alternative D would also close riparian areas to harvesting of woodland products.

Effects under Alternative E

Forest and woodland vegetation treatment levels under Alternative E would reflect a sustained yield calculation designed to result in no net loss of acres. Any wildfires that occurred would be counted towards annual treatment targets insuring the thresholds of treatment would never be exceeded. Implementing these management actions would ensure that sustainable woodland harvesting areas are maintained. Alternative E would only allow personal woodland

harvesting. Impacts from personal harvesting restrictions would be the same as those described under Alternative C.

Forestry and Woodland Products: Effects from Fish and Wildlife Management

Effects Common to All Alternatives

Maintaining habitat integrity, continuity, connectivity, and productivity to support self-sustaining fish and wildlife populations would ensure healthy sustainable woodlands are maintained. Implementing habitat improvement projects where necessary to stabilize or improve unsatisfactory or declining wildlife habitat conditions would also improve forest conditions. Applying use restrictions and NSO or CSU stipulations would also protect and provide sustainable forests while allowing for harvesting of woodland products.

Implementing timing restrictions and distance buffers during important life-cycle periods (e.g., breeding, nesting, fawning, and major migrations) may impact vegetation treatments and product utilization in the short term. However, clearance surveys may be used to minimize this impact.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Forestry and Woodland Products: Effects from Special Status Species Management

Effects Common to All Alternatives

Impacts from special status species management would be similar to those described under the wildlife section. Management aimed at maintaining and improving special status species habitat would directly impact woodlands and forests by helping to achieve forest health in these areas. Designating ACECs to protect sensitive plants and sensitive fish and wildlife would also protect forests and contribute towards forest health for stands located within ACECs.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Forestry and Woodland Products: Effects from Wild Horse and Burro Management

Effects Common to All Alternatives

Management of wild horses and burros within HMAs could directly impact forest and woodlands by concentrating soil compaction and browsing. In particular, forest and woodland species, such as aspen, willow, mahogany, and alder, could be browsed and broken, especially impacting young age classes. Horses and burros concentrate under canopies for shade and compact soils in these areas. Direct impacts on vegetation include the removal of forage, which alters the amount, condition, production, and vigor of vegetation in grazed areas. Direct impacts from management occur from year-long use, resulting in lower vigor of desired plant species and a change in plant species composition. Overuse of vegetation next to water sources, troughs, and stock reservoirs results in a loss of plant cover. This allows localized areas to become dominated by invasive plants. Vegetation recovery and regeneration of woodlands on burned areas could be slowed or reduced by wild horses and burros. Managing wild horses and burros in a manner that ensures significant progress is made toward achieving the Standards and Guidelines for Rangeland Health and Wild Horses and Burros, and other site-specific or landscape-level objectives would reduce the potential for adverse impacts.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Forestry and Woodland Products: Effects from Wildland Fire Ecology and Management

Effects Common to All Alternatives

Wildfire suppression and creation of fuel breaks would reduce the potential for catastrophic destruction of woodlands and forests over the long term and would help maintain sustainable woodland forests. Minimum impact suppression tactics would minimize unanticipated direct effects on forest and woodland resources during fire suppression activities. In addition, ESR and other rehabilitation treatments, such as seeding with native perennial species, would deter the spread of weeds and invasive species, directly and indirectly improving the composition of forests and woodlands. This helps to maintain native vegetation in woodlands and forests.

Because fire retardants are composed largely of nitrogen and phosphorus fertilizers, they may encourage growth of some species at the expense of others, possibly leading to changes in community composition and species diversity. Differential growth may also influence herbivorous behavior; both insect and vertebrate herbivores tend to favor new, rapidly growing shoots.

Fuels management actions would result in a short-term, direct loss of vegetation on a small scale. In the long term, fuel reduction projects would have direct impacts by reestablishing native vegetative communities, providing for healthy forests. These actions would allow fire to play its natural role more frequently and would reduce the likelihood of catastrophic wildfire. This would protect forest and woodland vegetation from direct destruction in the long term and over large areas.

Effects under Alternative A

Alternative A would manage wildfires in Category A, B C, and D, each with target fire suppression goals to protect property and resources. Fire suppression would protect forested habitat in areas threatened by fire, but can contribute to more damaging fires if dense understory vegetation builds up.

Effects under Alternative B

Alternative B would develop fire management plans to guide response to wildfire and prioritize suppression activities, and prioritizes ESR to deter cheatgrass and other invasive species from dominating burned areas and altering the natural fire regime by re-establishing appropriate species/subspecies. This approach would benefit forests more than current management.

Effects under Alternative C

Management under Alternative C would be similar to Alternative B, with more focus on protecting sensitive biological, cultural, and other natural resources, and use of native species in revegetation. This alternative would do the most to protect forests from fire damage.

Effects under Alternative D

Effects under Alternative D would be similar to those described for Alternative B but would focus on the urban interface zone.

Effects under Alternative E

Effects under Alternative E would be similar to those described for Alternative B.

Forestry and Woodland Products: Effects from Cultural Resources Management

Effects Common to All Alternatives

Protection of cultural resources would prevent direct disturbance and fragmentation of forests and woodlands. These areas are small relative to the amount of forested vegetation in the planning area; therefore, impacts would be localized.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Forestry and Woodland Products: Effects from Paleontological Resources Management

Effects Common to All Alternatives

Conservation measures and law enforcement actions would prevent direct disturbance to and degradation of forest and woodland habitat, while potentially impacting the ability to implement vegetation treatments in certain areas. These areas are small relative to the acres of forested vegetation; therefore, impacts would be localized.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Forestry and Woodland Products: Effects from Visual Resources Management

Effects Common to All Alternatives

Complying with VRM guidelines and objectives may restrict the size and location of woodland health management treatments. Impacts would vary based on the VRM classification of the specific project area. Class I and II guidelines would limit the scope of stand treatments or prescribed burning and would prohibit treatments and prescriptions that would change the visual character of the area, increasing the difficulty of accomplishing forest and woodland management actions. Overall, impacts would be expected to minor and localized.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Forestry and Woodland Products: Effects from Forestry and Woodland Product Management

Effects Common to All Alternatives

Under all alternatives, forest product management actions, including monitoring and stand treatments, would improve forest health over the long term by

increasing diversity in age classes and species composition. Implementing BMPs, standard operating procedures, and mitigation measures would minimize or reduce direct and indirect impacts on woodland habitats over the long term.

The proposed vegetation management actions would allow utilization of vegetative products for personal use under all the alternatives. Products available for harvest include but are not limited to firewood, Christmas trees, posts, poles, lumber, wildings, cuttings, native seed, and pine nuts. Harvest would only be allowed up to the maximum treatment acres or poundage proposed under each alternative with the exception of native seed (excludes pine nuts). Native seed collections typically occur on rangeland sites and include harvest seed from grasses, forbs, and shrubs for subsequent seeding of fires or restoration sites. The issuance of these permits is dependent upon seed availability/viability and site health, which vary significantly from year to year. Since the collection of native seed typically involves low impact hand harvest the impacts to vegetation are very minimal.

The collection and removal of vegetative products may affect stand woodland health in areas by the introduction of non-native species, damage to vegetation from vehicles and equipment, increased activity fuels, creation of access roads if permittees drive off existing roads to collect products.

Consideration of aspen, cottonwood, and mountain mahogany in implementation plans would reduce direct and indirect impacts on these species. Further, managing pinyon pine and juniper would improve stand health in these woodlands by removing unhealthy or diseased trees. These effects would be direct and long term.

Effects under Alternative A

Current management would continue under Alternative A, including allowing the cutting and sale of standing or downed cottonwood and aspen trees, outside of deer migration corridors, riparian areas and critical watersheds. Sales within identified high erosion areas must not reduce ground cover more than 50 percent. Pinyon nut harvests for personal use would be allowed as many as 25 pounds without a permit. Commercial collection of pine nuts may be allowed with field manager approval and the issuance of a commercial permit for fair market value.

This alternative allows for the collection of vegetative products to meet personal use and small scale commercial use. This alternative prevents any large-scale product utilization projects (e.g., biomass removal), which limits the ability to encourage new markets.

Effects under Alternative B

Alternative B and the other action alternatives would prohibit the harvest of live or dead/down cottonwood or aspen trees on personal-use firewood permits. Alternative B would also allow extraction of vegetative material for biomass

facilities. Pinyon nut limits for personal use would be similar to those described under Alternative A. This alternative proposes the highest amount of vegetative product removal; the actual impacts of this removal will depend upon current and future markets. Vegetative product removal would be limited to the acres of treatment proposed under this alternative; these acres are based on sustained yield calculations of available woodland (See **Section 3.3.1**, Forestry and Woodland Products). Issuing commercial permits would include permit stipulations or requirements to protect the soil, water, and vegetation that would maintain forest health.

Effects under Alternative C

Under Alternative C, no commercial permits would be issued. Vegetative product removal would be limited to the acres of treatment proposed under this alternative; these acres are based on sustained yield calculations of available woodland (See **Section 3.3.1**, Forestry and Woodland Products). The reduction of personal use limits from 25 pounds to 10 pounds may reduce the likelihood for illegal collection going undetected because small-scale collectors are also selling nuts in the local market.

Effects under Alternative D

Effects under Alternative D would be similar to those described for Alternative B with fewer acres available for product harvest. This alternative prohibits commercial pine nut collection within the Pine Nut, Virginia, and Stillwater Mountain Ranges and in Alpine County. The rest of the planning area would be available for commercial pine nut collection.

Effects under Alternative E

Effects under Alternative E would be similar to those described for Alternative C, with fewer acres available for vegetative product removal. Impacts would be limited to the acres of treatment, which are based on sustained yield calculations of available woodland (**Section 3.3.1**, Forestry and Woodland Products). This alternative prohibits commercial pine nut collection.

Forestry and Woodland Products: Effects from Livestock Grazing Management

Effects Common to All Alternatives

Forests and woodlands would be subject to grazing of young trees' shoots and trampling of saplings, as well as indirect impacts such as soil compactions and higher weed spread potential. Woodland stand health objectives may be affected by a decrease in diversity of age classes.

Effective grazing management and range improvement actions would improve forest health including maintenance of various age classes of vegetation, protection of sensitive areas, including riparian areas, and control of weed spread.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Forestry and Woodland Products: Effects from Geology and Mineral Management

Effects Common to All Alternatives

Impacts on forest and woodland vegetation could result from fluid, leasable, and locatable mineral development and mineral material sales or disposal. Direct impacts associated with these actions include loss of or injury to plants due to excavation or trampling and increased exposure to dust and weed spread associated with construction and use of access roads. In some instances, all vegetation would be removed from a parcel. In these cases, the proponent would be required to pay fair market value for the vegetation that was destroyed, reducing the potential availability of woodland products. Other impacts on woodlands would vary depending on the size of disturbance and if location of proposed mineral actions are within woodland stands. Delineating closed areas to mineral development, implementing use restrictions, NSO and CSU stipulations, and withdrawals would protect woodland stands within delineated areas.

Under all alternatives, BMPs would be implemented, and revegetation would be required during operation, thus minimizing and mitigating impacts. Unnecessary roads would be closed to reduce fragmentation and to restore habitat. In addition, special status species habitat would be avoided, thus protecting some forest and woodland areas.

Effects under Alternative A

Alternative A would open the greatest acreage (**Table 2-1**) and would close the least acreage of forest and woodland to mineral development, thus having the greatest likelihood to impact forest and woodland vegetation.

Effects under Alternative B

Compared to Alternative A, Alternative B would open fewer acres and close more acres (**Table 2-1**) to mineral development, thus having a lower likelihood to impact forest and woodland vegetation.

Effects under Alternative C

Alternative C would open the fewest acres (**Table 2-1**) and would close the most acres of forest and woodland to mineral development, thus having the lowest likelihood to impact forest and woodland vegetation of all alternatives.

Effects under Alternatives D and E

Based on the acres open and closed to mineral development, Alternatives D and E would have a lower likelihood to impact forest and woodland vegetation than Alternative A.

Forestry and Woodland Products: Effects from Recreation and Visitor Services

Effects Common to All Alternatives

Managing BLM-administered lands to provide dispersed recreation could impact forests and woodlands through direct trampling, or indirectly through human disturbance, soil compaction, weed introduction or spread, increase the potential for human-caused fire, and increased dust. Together, these would reduce forest and woodland health and vigor, alter stand composition, and lower habitat value.

Recreation uses would impact forestry and woodlands from activities such as camping, target shooting, and hunting. The potential for human-caused fire on forest stands and woodlands would increase depending on the number of recreationalists. Illegal harvest of trees for firewood could damage forests.

Motorized travel is the most damaging form of recreation, resulting in soil and streambank erosion, habitat trampling, and woodland disturbance. OHV management actions that result in increased OHV use would have higher impacts on forest resources.

All alternatives would provide a wide range of developed and dispersed recreation opportunities to meet projected recreation demand in the planning area. All alternatives would also manage recreation use on BLM-administered land to protect natural resources, provide for health and safety, and minimize conflicts among land uses. Increased recreation use and OHV use has the potential to impact forest and woodland resources through the potential for human caused wildfire, soil compaction from OHV use, introduction of invasive or noxious weeds, cutting of limbs or live trees for campfire use, and traffic congestion with product transport vehicles and recreational vehicles using the same road system.

Effects under Alternative A

Under this alternative, the BLM would continue to manage 67,700 acres in the Walker Lake and Alpine SRMAs. Continued management of these lands as SRMAs could encourage additional use of these lands and thus increase damage to woodland areas. Implementation of BMPs and development of mitigation measures would reduce impacts.

Effects under Alternative B

Under Alternative B, the BLM would manage 76,100 acres as SRMAs, 12 percent more than Alternative A. The Alpine and Walker Lake SRMAs would be maintained but reduced in size, and four additional SRMAs would be designated, identifying recreation as the principal use of these lands. Managing lands as SRMAs could encourage additional use of these lands and thus increase soil compaction and dust. Alternative B would also establish 7 ERMAs further increasing the potential for visitation. This alternative would have the highest potential for increased use of these areas and, therefore, damage to woodland resources.

Effects under Alternative C

Under Alternative C, 74,700 acres would be designated as SRMAs, 10 percent more than Alternative A. The Walker Lake SRMA would be maintained and the Alpine SRMA expanded, and one new SRMA, Sand Mountain, would be established. Fourteen ERMAs would also be established. Alternative C would manage fewer SRMAs, reducing the potential for development of recreational facilities that would attract visitors, and would place the most limitations on motorized travel use.

Effects under Alternative D

Three new SRMAs would be designated, and one (Walker Lake) closed, for a total of 67,100 acres managed as SRMAs, approximately the same as Alternative A. Four ERMAs would also be established, including one in the urban interface zone.

Effects under Alternative E

This alternative would designate four new SRMAs while reducing the size of the Walker Lake SRMA, for a total of 106,100 acres, 63 percent more than Alternative A. Fourteen ERMAs would also be established. Impacts would be similar to Alternative D.

Forestry and Woodland Products: Effects from Comprehensive Travel and Transportation Management

Effects Common to All Alternatives

Maintaining roads would allow access to forests and woodlands. This would help achieve forest and woodland vegetation management goals in the long term and would assist in accessing resources for development. Roads may spread noxious weeds into forests and woodlands. BMPs and mitigation measures to minimize

this spread would indirectly help improve forest health and stand composition in the long term.

Effects under Alternative A

Under Alternative A, there would be no change to current acreage open to motorized and mechanized travel (see **Table 2-1**) or limited to existing routes. Alternative A would have the greatest impact on forests and woodlands from motorized travel and road and trail construction, including vegetation removal, soil compaction, and increased dust. Under Alternative A most of the planning area (3,840,300 acres) would be open to motorized use with limited travel management delineated at 924,300 acres and closed areas at 31,800 acres. There would be potential for damage to woodlands from soil compaction and erosion. These activities would decrease forest and woodland health and vigor, alter stand composition, and lower habitat value. Improved and increased access to stands would also facilitate implementation of forest treatments and allow for multiple uses.

Effects under Alternative B

Under Alternative B, over 3,500,000 additional acres (**Table 2-1**) would be limited to existing routes. Under Alternative B, 95,300 acres would be open to motorized use, with 4,677,000 acres limited and 26,700 acres closed. The increase in acres restricted to existing routes would provide more protection for forest resources from road impacts than under current management. This alternative would reduce impacts on woodlands use compared to Alternative A.

Effects under Alternative C

Under Alternative C, approximately an additional 1.5 million acres (**Table 2-1**) would be closed to motorized travel and an additional 2 million acres limited to existing routes. OHV use would be the most restricted under this alternative, managing 1,190,500 acres as closed, 3,013,500 acres as limited, and 1,300 acres as open to OHV use. The smallest amount of acreage would remain open to motorized travel, resulting in the lowest level of impacts on forest resources from OHV use. However, this alternative would restrict access into areas for woodland harvesting

Effects under Alternative D

Alternative D management would be similar to Alternative B, managing 30,600 acres as closed, 4,748,400 acres as limited, and 22,700 acres as open. With fewer acres managed as open to motorized and mechanized travel and more acres managed as limited to existing routes, management under this alternative would better protect forest resources from road and other travel-related impacts. Impacts on woodlands would be lower than under Alternative A.

Effects under Alternative E

Under this alternative, the BLM would manage 24,100 acres as closed, 4,717,300 acres as limited (including priority wildlife habitat areas), and 55,700 acres as

open to OHV use. These closure levels and limitations are more protective of forest resources than Alternative A.

Forestry and Woodland Products: Effects from Lands and Realty

Effects Common to All Alternatives

Vegetation and wildlife habitat value would be given consideration in disposal and acquisition decisions. Impacts on forest and woodland vegetation would vary on a case-by-case basis, but impacts would be minimized since only lands with little resource values would be identified for disposal, and further NEPA documentation would minimize potential impacts on forests and woodlands. Acquisition of forests and woodlands would enhance forest and woodland resources.

ROWs alter habitat with their footprint. Most of the footprints are localized and cover a small area, but ROWs tend to be linear and stretch for miles. Impacts from ROWs include permanent removal of forest and woodland vegetation, introduction and spread of weeds, soil compaction, habitat disturbance and fragmentation, and increased dust. In the long term, this would lower forest and woodland health and vigor, alter stand composition, and lower habitat value.

Effects under Alternative A

Alternative A would not manage additional ROW avoidance areas. Existing ROW exclusion areas (564,100 acres; **Table 2-1**) would continue to be managed under Alternative A. Forests within ROW exclusion areas would be protected from ROW development. ROW development impacts outside of exclusion areas would continue, resulting in habitat fragmentation, loss of vegetation, and increased potential for weed spread. Under this alternative, 179,700 acres of BLM-administered land would be identified for disposal. Disposal lands may enhance forest resources if the disposal enables the BLM to acquire other land to form contiguous habitat parcels.

Effects under Alternative B

Under Alternative B, 1,195,800 acres (**Table 2-1**) would be managed as ROW avoidance areas. Forest health would be maintained as projects within ROW avoidance areas would be subject to stipulations that would protect resource values. ROW exclusion areas would remain at levels similar to Alternative A (580,000 acres). Under this alternative, 273,500 acres of BLM-administered land would be identified for disposal. Overall, management under Alternative B would be more protective of forest resources than Alternative A because of the establishment of ROW avoidance areas and a 15,900-acre increase in ROW exclusion areas.

Effects under Alternative C

Under Alternative C, 2,675,800 acres would be managed as ROW exclusion areas and 369,300 acres (**Table 2-1**) as ROW avoidance areas. Forests would

be protected from development within ROW exclusion areas. Forest health would be maintained based on implementation of special stipulations that protect or reduce impacts on resources within ROW avoidance areas. No acres of BLM-administered land would be identified for disposal under this alternative. This alternative would afford the greatest protection to forest woodlands from lands and realty management compared to other alternatives.

Effects under Alternative D

Under Alternative D, the BLM would manage 564,100 acres as ROW exclusion areas and 1,226,100 acres as ROW avoidance areas. Impacts would be similar to Alternative B, however 15,900 fewer acres would be protected within ROW exclusion areas.

Effects under Alternative E

Under Alternative E, the BLM would manage 605,900 acres as ROW exclusion areas and 1,448,200 acres as ROW avoidance areas. Acres identified for disposal would also increase. More acres containing forests would be protected within ROW exclusion areas compared to Alternatives A, B, and D. However, the BLM would manage fewer ROW avoidance area acres compared to Alternatives B and D. This alternative would afford the second highest level of protection.

Forestry and Woodland Products: Effects from Renewable Energy

Effects Common to All Alternatives

Direct impacts on forest and woodland vegetation could occur from renewable energy projects and associated issuance of new ROWs, which require vegetation clearing and access roads that disturb or destroy forests and woodlands. Weed spread or introduction could result as an indirect impact of renewable energy-associated ROWs and would result in reduced forest health. BMPs, stipulations, and mitigation measures would minimize direct and indirect impacts on forest vegetation.

Effects under Alternative A

Current management does not manage any avoidance areas for wind energy, and this would continue under Alternative A. Approximately 905,900 acres (**Table 2-1**) are managed as variance areas for solar projects. Variance areas allow development but require provisions to protect resources in the area. Outside variance areas, utility-scale solar energy development would not be permitted. Outside of exclusion and variance areas Alternative A would provide limited protection to forests from renewable energy impacts.

Effects under Alternative B

Alternative B would manage 773,400 acres as variance areas for solar energy development and 1,220,200 acres as avoidance areas for wind energy turbines or transmission lines. Management of avoidance areas would protect forests and woodlands from disturbance and limit indirect effects, such as noxious weed

invasion or spread caused by development. These provisions would protect forests in the designated areas more than current management.

Effects under Alternative C

Renewable energy impacts on forest resources would be reduced most under Alternative C due to the delineation of 2,073,200 acres as wind energy exclusion zones. Designating exclusion zones would have the greatest benefit for forests and woodlands by protecting against direct disturbance and by limiting indirect effects such as noxious weed invasion. Approximately 600,000 acres would be managed as variance areas for utility-scale solar development, protecting more acreage from large-scale solar projects.

Effects under Alternative D

Impacts under Alternative D would be similar those described under Alternative B.

Effects under Alternative E

Under Alternative E, the BLM would manage 629,900 acres as variance areas for utility-scale solar energy development, and 629,900 acres of wind energy avoidance and exclusion zones. This alternative would protect forests and woodlands more than Alternative A.

Forestry and Woodland Products: Effects from Areas of Critical Environmental Concern

Special management areas, such as ACECs, result in increased protection of forest resources, and long-term improvement or maintenance of habitat quality as a result of special management and use restrictions in these areas. However, establishment of ACECs would restrict harvesting of forest resources in certain ACEC due to OHV motorized travel closures.

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under current management, the BLM manages 6 ACECs (21,800 acres), the largest being the Stewart Valley Paleontological Area (**Table 2-1**). Management of these areas under Alternative A would continue to restrict development to protect sensitive resources, providing incidental protection to forest habitat from loss or damage. Only 400 acres of forests would be protected in ACECs under this alternative.

Effects under Alternative B

Under Alternative B, an additional 9 ACECs (371,170 acres, including 133,100 acres of woodlands) would be established in the planning area. Forests in these areas would have enhanced protection from development as an incidental result of protection of other resources, primarily cultural resources.

Effects under Alternative C

Under Alternative C, an additional 18 ACECs (786,270 acres, including 180,300 acres of woodlands) would be established in the planning area. This alternative would protect the largest amount of land through management of ACECs and includes ACECs for botanical species and Greater Sage-Grouse. Forest resources in these areas would have enhanced protection from development as an incidental result of protection of other resources, but access and harvesting would be limited.

Effects under Alternative D

Under Alternative D, 11 ACECs (180,000 acres, including 76,400 acres of woodlands) would be established in the planning area. This alternative would have more acreage in ACECs than Alternative A. Forests in these areas would have enhanced protection from development as a result of protection of other resources.

Effects under Alternative E

Under Alternative E, 8 ACECs (82,770 acres, including 18,400 acres of woodlands) would be established in the planning area. The BLM would manage more acreage in ACECs than Alternative A, but fewer than the other action alternatives. It would provide additional protection in newly designated ACEC areas compared to current management.

Forestry and Woodland Products: Effects from Tribal Interests

Effects Common to All Alternatives

Tribal interest could limit certain vegetation management action or limit harvesting of forestry and woodland products in areas in order to protect Native American traditional use areas.

Tribal consultation is not likely to adversely impact forest resources. Consulting with tribes to identify culturally significant plants, important habitats, and traditional use locations would emphasize protection of natural resources, including forests and woodlands. This would limit direct disturbance to woodlands in certain areas. Consultation could place higher treatment priority in areas not previously identified or limit actions in planned treatment areas. Impacts would be direct and localized.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Forestry and Woodland Products: Cumulative Impacts

Table 4-1 lists the past, present, and reasonably foreseeable cumulative actions for the CCD. Pinyon and juniper thinning and reduction projects under the alternatives would reduce the acreage of these woodlands in the short term with expansion and infilling of trees replacing those lost to vegetation treatments. Fuels treatments, including prescribed understory burns in forested areas, would protect woodlands by reducing the potential for a stand-replacing fire. Potential increases in minerals, renewable energy, and lands and realty actions under the alternatives would disturb forest stands. Impacts from these uses would be reduced with implementation of permit stipulations, BMPs, standard operating procedures, and mitigation measures. Climate change trends of including higher tree densities, expansion of pinyon-juniper, and mortality from drought, insects and disease are expected to continue. Aspen groves and riparian woodlands are forecast to continue to decline. Woodlands in areas proposed for ACEC designation and priority wildlife habitat areas would be protected from these trends by management actions and also prioritized for fire suppression response, reducing the potential for wildfire.

4.4.2 Livestock Grazing**Summary**

This section discusses impacts on livestock grazing from proposed management actions of other resources and resource uses. Existing conditions are described in **Section 3.2.2**, Livestock Grazing.

Consistent with BLM Washington Office Instruction Memorandum No. 2012-169, criteria considered while developing livestock grazing alternatives included suitability for grazing, riparian issues, private land conflicts, recent use (10 years or longer since land was used or permitted), and special use areas (e.g., threatened and endangered species). Across all alternatives, the variation in permitted AUMs from high to low is 73 percent, and variation in areas available to livestock grazing is 44 percent.

Grazing would be impacted when all or part of an allotment is temporarily made unavailable to livestock grazing (such as during vegetation treatments, fire, drought, or watershed or riparian restoration) or made unavailable to grazing (to protect other resources such as sensitive species and cultural or paleontological resources) or when changes in grazing management practices are needed to support objectives for other resources. Under all alternatives, potential for conflicts with other resource uses may occur. Due to the high level of urban interface and the growing importance of recreation in the planning

area, conflicts with recreation are possible under all alternatives; conflicts would be minimized where recreation could be focused in specific areas (as in Alternative B and E).

In general, Alternative A would maintain the current level of grazing and impacts from Alternative B would have minimal changes to areas available for grazing or permitted AUMs, but may increase the level of development and recreational use, resulting in the potential for increased disturbance to grazing management. Alternative C includes a 44 percent increase in acres unavailable to livestock grazing and 73 percent decrease in permitted AUMs compared to Alternative A. In addition, Alternative C would impose the highest level of limitations on access to allotments and decrease the flexibility in grazing management by imposing restrictions on season of use and range improvements. Under Alternative D management actions will focus on the urban interface area. Implementation of specific management actions in this area may introduce some local limitations on livestock grazing management, but it is likely to reduce conflicts between recreation and livestock grazing, which are high in the urban interface. Alternative E combines actions from other alternatives and balances limitations on livestock grazing management with increased flexibility, especially in situations where rangeland health is maintained, thereby mitigating impacts on grazing management.

Variation in acres available to grazing and permitted level of AUMs is shown in **Table 4-14**, Change in Area Permitted for Grazing. Additional restrictions within areas available to grazing may be implemented under all alternatives.

No impacts or negligible impacts would result to livestock grazing from management actions proposed for the following resources and resources uses: air quality, caves and cave resources, forestry and woodland resources, public health and safety, interpretation and environmental education, social and economic conditions, and environmental justice.

Table 4-14
Change in Area Permitted for Grazing

	A	B	C	D	E
Indicator					
Acres unavailable for livestock grazing	6,700	6,100	2,702,000	10,700	6,100
Acres available for livestock grazing	4,796,600	4,797,200	2,101,300	4,792,600	4,797,200
Permitted AUMs*	151,200	151,200	40,700	150,800	151,200

Source: BLM GIS 2014a

*Permitted AUMs by alternative are approximant numbers. When management direction results in a partial closure of an allotment, the percent of closure is used to determine the percent of AUMs permitted (e.g., 70 percent closure results in 70 percent reduction in permitted AUMs).

Methods of Analysis

Methods and Assumptions

The following methods and assumptions were used to assess the impacts on livestock grazing:

- All new and existing leases and permits will be subject to terms and conditions determined by the BLM Authorized Officer to achieve the management and resource condition objectives for BLM-administered lands and to meet BLM Nevada Public Land Health Standards.
- Management actions will be in accordance with the Omnibus Public Land Management Act of 2009, Subtitle E; Section 4(d)(4) of the Wilderness Act (16 United States Code [USC] 1133[d][4]); and the guidelines set forth in Appendix A of the report of the Committee on Interior and Insular Affairs of the House of Representatives accompanying HR 2570 of the 101st Congress (H. Rept. 101-405).
- Range improvements (e.g., fences, pipeline, water wells, troughs, and reservoirs) could result in a localized loss of vegetation cover throughout the improvements' useful life. Vegetation will be reestablished through reclamation practices along water pipelines within 5 years to the extent possible, whereas areas with fences, water wells, troughs, and reservoirs could contain a portion of the area disturbed during their useful life and will be revegetated when abandoned.
- The construction and maintenance of existing range improvements will continue in the decision area as needed. New range improvements could be subject to limitations, as defined in the RMP. Range improvements lead to better livestock distribution and management options, and maintain or improve rangeland health.
- By definition in this RMP, livestock grazing is not considered a surface-disturbing activity, but it could affect the surface in areas where livestock concentrate.
- Grazing preference is attached to base property owned or controlled by a permittee or lessee.
- Permitted AUMs by alternative are approximate. When management calls for a partial closure of an allotment, the percent of closure is used to determine the percent of AUMs permitted (i.e., 70 percent closure results in 70 percent reduction in permitted AUMs). Due to variability of acres in GIS data, changes of less than 100 acres are discounted. Actual changes in permitted AUMs will be determined during a periodic review or as specified in management direction by alternative.

Indicators

The following indicators were used to assess the degree of impacts on livestock grazing:

- A change in permitted AUMs in areas available for livestock grazing due to various resource issues or conflicts, or cumulative management actions
- An increase in forage levels that could allow an increase in permitted AUMs across the decision area
- Restrictions or prohibitions on the ability to construct or maintain range improvements and conduct treatments (infrastructure and vegetation)
- Closure of areas to livestock grazing
- Restrictions or prohibitions on the kind of livestock permitted
- Changes in the timing, duration, season, or frequency of permitted use

Nature and Type of Effects

Impacts on livestock grazing are the result of activities that affect forage levels, areas available to grazing, kind of livestock, season of use and timing, and ability to construct range improvements as well as human disturbance or harassment of livestock in grazing allotments. Key types of impacts are detailed below.

Management actions for climate change may require adjustment of grazing practices or permitted levels of AUMs should forage levels change over time based on changing climate patterns.

Management of vegetation resources enhances vegetative conditions and indirectly affects livestock grazing by increasing vegetation productivity and improving forage conditions in the long term. Vegetation treatments designed to reduce the incursion of nonnative annual grasses, such as cheatgrass and encroachment of shrubby vegetation, could have short-term effects on livestock grazing by removing forage and temporarily excluding livestock. However, these treatments generally enhance rangeland conditions by maintaining the forage base (the amount of vegetation available for wildlife and livestock use) in the long term. Allowing vegetation treatment areas to rest would result in direct short-term limited livestock management impacts such as decreases in AUMs, livestock herding, pasture rotations, and exclusion from the treated area. In the long term, resting treated areas would enhance vegetation by allowing seedlings to establish, resulting in a sustained forage base. Livestock grazing would improve over the long term as the ecological condition of vegetation in grazing allotments improves following restoration. Prescribed grazing is the application of domestic livestock grazing at a specified season and intensity to accomplish specific vegetation management goals, typically outside of permitted allotments.

Prescriptive grazing could potentially provide additional options to livestock operators, however, the degree to which prescriptive grazing would represent a meaningful increase in available forage would depend on the level of use, which is often variable and sporadic.

Unregimented livestock grazing can have adverse impacts on riparian ecosystems (Armour et. al 1991); therefore, managing riparian habitat can directly impact livestock grazing through excluding livestock at specific sites, implementing trailing only, increasing herding, adding range improvements (such as cross fences and water gaps), and adjusting season of use and livestock numbers.

Modified livestock grazing management practices could be necessary where soils are found to be sensitive to livestock disturbances (for example, soil on steep slopes and fragile soils). Short-term direct impacts on livestock grazing from soil resource management would consist of adjustments in season and duration of use to prevent erosion and soil compaction caused by congregating cattle. In the long term, however, soil resources management would generally result in protection of soils and help provide healthy plant communities, which can benefit livestock grazing by maintaining or increasing the forage base in the long term.

Managing for healthy watersheds provides for necessary water sources and improved forage conditions for livestock grazing in the long term. Protecting water quality and watershed health could require changes in livestock management, such as deferring or shortening grazing periods, adding range improvements, excluding grazing from riparian areas, establishing riparian pastures, and increasing livestock herding.

In areas next to public water supplies, there could be stricter regulations for livestock management to limit contamination of water supplies. These limitations include exclusion areas or other restriction on livestock management. This could result in increased costs to permittees if changes resulted in AUM reduction or increased livestock management costs.

Developing water sources for multiple uses would impact livestock grazing by making more water available. More dispersed water sources would prevent livestock from concentrating around current water holes and would allow for changes in utilization patterns, which may result in an increase in available forage.

Wildlife species could compete with livestock for forage, water, and cover when they occupy the same area. Big game species such as elk, bighorn sheep, pronghorn, and deer compete for similar forage as cattle, sheep, and horses. Fish and wildlife habitat management activities would directly affect livestock grazing through restrictions on grazing management, such as increased rotation, timing, or season of use and/or reduced forage. However, actions to improve or

expand wildlife habitat could also improve forage conditions in the long term and indirectly maintain or increase forage production.

Limitations on domestic sheep and goat grazing could be recommended in occupied bighorn sheep habitat to protect the bighorn sheep from disease transmission. A substantial change in livestock grazing management flexibility would result when domestic sheep grazing is prohibited or restricted in bighorn sheep occupied habitat. If an allotment is converted from domestic sheep use to cattle use, the operators would need to either change the kind of livestock in their operation or seek other grazing lands. This could result in financial hardship to permittees to the extent that they could be forced out of the sheep industry.

In habitat for special status species, including Greater Sage-Grouse, reduction in AUMs, closure of areas to livestock grazing, timing limitations or other limitations on management activities may be applied, resulting in increasing management of livestock, increased time and cost to permittees.

When livestock and wild horses occupy the same area, their needs for water and forage are competitive. Competition for water and forage can be mitigated through adjustments in season of use, AUMs, AMLs and water developments. This would improve distribution of livestock and wild horses and burros. In the short term, however, adjustments typically emphasize changes to livestock grazing management, which can result in increased time and costs for permittees.

Wildland fire would have varying effects on livestock grazing, depending on fire location and its size, intensity, severity, and timing. Initially, wildland fire would likely displace livestock, and, depending on the proximity to the fire, livestock could be stressed, injured, or killed. Wildland fire would remove vegetation and forage over the short term. Additional impacts on livestock operations could occur when BLM guidelines require a rest period following rehabilitation before grazing is reestablished. Over the long term, wildland fire could improve forage production, especially when post-fire management efforts are implemented, such as reseeding. Restoring natural disturbance regimes, such as fire, and using vegetative treatments to accomplish biodiversity objectives to improve plant community resilience, would also benefit livestock grazing by maintaining a balance of seral stages. In general, removing woodland species benefits livestock grazing by creating a healthier grass, forb, and shrub community.

Activities associated with the management of cultural resources would affect relatively small areas (typically less than 1 acre) and with minimal effects on livestock grazing. In general, information provided by cultural resource inventories can limit or eliminate livestock management activities (specifically the presence or location of range improvements) on a case-by-case basis. For example, fencing some cultural sites could exclude grazing and cause a loss of available forage. Restrictions on surface disturbance and other disruptive

activities near cultural sites could require that some range improvements be modified or relocated, and, in rare cases, improvements could be precluded.

Livestock and their handling facilities could be authorized under all VRM classes; however, the design and placement of new range improvements in VRM Class I and II areas would have to be constructed in particular manner as identified in BLM Handbook H-8410-I. As a result, the cost of constructing fences, water tanks, and other range improvements could increase, which could increase costs for permittees. Areas classified as VRM Classes I and II could preclude the installation of certain projects. In general, VRM classes that restrict surface-disturbing activities because of their potential effect on visual resources would indirectly help maintain forage levels by reducing activities from BLM-administered land uses. However, if surface disturbance limitations were to restrict livestock improvements and management opportunities, then permittees may not be able to distribute livestock to effectively use allotments; the result could be an overutilization in some areas of an allotment, a decrease in AUMs, or an increase in permittees' cost or time.

Implementing particular livestock grazing management actions could affect livestock grazing by increasing operators' costs or changing management actions. Adjusting AUMs could potentially impact the rancher negatively or positively depending on the situation. Short-term and long-term costs to permittees could also change due to the following:

- Implementation of grazing strategy or modification to grazing systems
- Changes to allowed utilization level
- Change in season-of-use or livestock class
- Construction of range improvements or other approaches to meet rangeland conditions objectives or provide protection for other resources

The following allotments are closed due to conflicting public uses (airports, campgrounds, county and state parks) and other limitations listed below:

- Central. This allotment has been found to be too small to feasibly manage for grazing because there are no adjacent grazing allotments, and private properties containing homes that cattle may enter are within or adjacent to the allotment.
- Churchill Butte. Private properties containing homes that cattle may enter are within or adjacent to the allotment.
- Hangman. This allotment has been found to be too small to feasibly manage for grazing because there are no adjacent grazing allotments.

- Harvey Flat. This allotment has been found to be too small to feasibly manage for grazing because there are no adjacent grazing allotments, and private properties containing homes that cattle may enter are within or adjacent to the allotment and for other conflicting uses.
- Horse Spring. Stray horses have removed palatable vegetation within the allotment, and livestock safety would be at risk due to the close proximity to roads within the urban interface.
- Indian Creek. This allotment has been found to be too small to feasibly manage for grazing because there are no adjacent grazing allotments.
- Koch Ditch. This allotment has been found to be too small to feasibly manage for grazing because there are no adjacent grazing allotments, and private properties containing homes that cattle may enter are within or adjacent to the allotment.
- Milberry. This allotment has been found to be too small to feasibly manage for grazing because there are no adjacent grazing allotments and for other conflicting uses.
- Red Rock. This allotment has been found to be too small to feasibly manage for grazing because there are no adjacent grazing allotments, and it is landlocked by home owners whose property cattle may enter. Livestock safety would be at risk in this allotment due to the close proximity to roads within the urban interface.
- Stockton Flat. Stray horses have removed palatable vegetation within the allotment, and livestock safety would be at risk due to the close proximity to roads within the urban interface.
- Truckee-Virginia. Private properties containing homes that cattle may enter are within or adjacent to the allotment, and livestock safety would be at risk due to the close proximity to roads within the urban interface.
- Wade Valley. This allotment has been found to be too small to feasibly manage for grazing because there are no adjacent grazing allotments.
- Wedekind. This allotment has been found to be too small to feasibly manage for grazing because there are no adjacent grazing allotments, and it is landlocked by home owners whose property cattle may enter.

Impacts on grazing operators could occur if closures or restrictions occur in currently active allotments, especially if an area proposed for closure or restriction represents an allotment's primary use area. Adjusting seasons of use could limit permittee flexibility; reducing the amount of available forage in the

short term. Timing of livestock removal may cause additional impacts if it coincides with ranchers critical growing season on base property. Restriction on kind of livestock allowed in an allotment would most likely have an impact on the operator, both directly and indirectly. This type of change could cause the operator to seek grazing lands elsewhere to replace the area lost, and may necessitate purchase or rental of lands, or construction of new range improvements. If such costs are prohibitive to continuing grazing, operators could go out of business. In the long term, implementing BMPs and grazing management systems that achieve the Standards and Guidelines for Rangeland Health would improve forage conditions, indirectly improving livestock health.

Construction of range improvements that would improve livestock distribution and allow use of a larger portion of the rangeland would generally enhance rangeland health in the long term; however, it could impact the livestock permittee economically in the short term. Constructing off-site water sources and fencing riparian and spring sources could keep livestock away from sensitive riparian areas and provide a cleaner, more-reliable water source for livestock. In other cases, rangeland management changes could be designed to protect other resources or resource uses, such as cultural resources or threatened and endangered species. In these instances, management changes could result in additional limitations on livestock grazing, and no changes or enhancement to rangeland conditions. Forage banks are allotments where a previous permit has been relinquished or cancelled which are maintained for use to provide alternate grazing opportunities for ranchers after wildfires, restoration projects and during droughts. Management actions that allow forage banks would therefore provide enhanced management options for permittees/leases.

Energy and mineral development could impact grazing. During the exploration and testing phase of mineral development, there would be minimal acreage directly impacted. However, impacts on livestock dispersal and trespass could occur, increasing time and cost to permittees. In particular, should development occur in a small allotment, there is the potential for significant loss of AUMs for the affected permittee due to loss of available grazing acres. Surface-disturbing mineral development directly affects grazing areas in the short term during construction of well pads, roads, pipelines, and other facilities. Potential impacts include changes in available forage, reduced forage palatability because of dust on vegetation, limits on livestock movement, harassment, temporary displacement of livestock, and an increased potential for the introduction and proliferation of noxious weeds. This would cause a loss of livestock forage and associated AUMs. In the long term, a smaller amount of grazing acreage is permanently lost from mining operations, with the impact level dependent on the permanent acres of disturbance. Improving roads associated with mineral development could facilitate livestock management operations by maintaining or improving access to remote locations within allotments. Properly implemented BMPs and reclamation mitigation measures would likely improve rangeland health and forage levels for livestock.

Likewise, renewable energy development affects areas of grazing in the short term during construction of access roads and facilities (such as wind turbines, solar panels, and biomass plants). Impacts include temporary loss of forage, reduced forage palatability because of dust on vegetation, and temporary harassment and displacement of livestock. In the long term, a smaller amount of permanent grazing acreage would be lost, depending on the size of these operations.

Recreation can affect livestock grazing directly through human disturbance and indirectly through rangeland degradation. Direct disturbance can include undesired animal dispersing or trespassing due to gates left open by recreational users; animal displacement, harassment, or injury from collisions or shooting; or damage to range improvements. In addition, OHV use results in indirect impacts, such as increased dust on forage in high-use areas, leading to lower forage palatability. The degree of impacts would vary with the intensity of recreation, the timing of recreation activities (livestock could be more susceptible to disturbance during the spring when young are present), and location of recreation in the allotment (a higher level of disturbance could occur near areas frequented by livestock such as water sources or salt licks).

Due to management priorities, in SRMAs, grazing practices could be changed to accommodate recreation if visitor experience would be negatively affected by livestock grazing. Should these changes result in increased costs or time required by permittees, this could result in permittees' inability to fully utilize an allotment. In ERMAs, there would be a balance, or compromise, between recreation and grazing. ERMAs are managed for specific activities. While conflicts are possible, these management areas focus on a balance of recreational activities and grazing management needs; therefore, there are likely to be fewer changes required to grazing systems as a result of recreation management in ERMAs. Throughout SRMAs and ERMAs, development of recreation facilities could displace livestock and reduce area available for grazing on a given allotment. Overall, establishment of SRMAs and, to a lesser extent, ERMAs may focus recreational use in specific portions of the planning area, while these areas may become less compatible with grazing, the level of conflicts with dispersed recreation and livestock grazing could be reduced for the overall planning area. Public perception of livestock grazing and the degree to which BLM-administered land users see grazing as a compatible use may also differ depending on the recreation setting, with urban area land users less likely to see grazing as a compatible use. (Brunson and Steel 1996).

In general, transportation routes may provide access for permittees to range improvement and allow for expedited checking of livestock. Short-term impacts of road construction and temporary road closures include loss of forage, harassment, and livestock displacement. Long-term direct and indirect impacts on livestock from newly developed transportation routes include loss of forage, reduced forage palatability because of dust on vegetation, and disturbance and

harassment caused by increased levels of human activities. Decommissioning roads from the system inventory could directly impact permittees' access to their livestock. Conversely, when travel is closed or limited to existing or designated trails within areas available to livestock grazing, but administrative access is maintained, permittees could benefit from reduced livestock disturbance. Closing road or trails not leading to range improvements would also increase forage availability when the area is rehabilitated or when natural rehabilitation occurs.

Lands and realty actions, such as small land transfers and ROW authorizations (e.g., for power lines, pipelines, and other structures), could have short-term impacts, including temporary forage removal, livestock displacement, and an increased potential for noxious weed introduction and spread. The time frame for short-term displacement of livestock from a ROW can vary from a few weeks to months during construction, or last as long as two years (or more) following reclamation depending on the activity permitted in the ROW. Livestock can also be injured or killed during the construction and use of ROWs from open trenches and vehicle collisions if proper mitigation measures are not in place. Management of ROW exclusion areas would prohibit development for utilities in these areas and, therefore, reduce short- and long-term impacts on grazing. Similarly, ROW avoidance areas would limit impacts. Long-term impacts on livestock from site-specific lands and realty actions include changes in and loss of forage, reduced forage palatability because of dust on vegetation, and livestock disturbance and harassment from increased levels of human activities.

Acquisition of private lands within allotments can improve access for permittees and management options for livestock movement, or can provide additional resources, such as water. Land disposals may alter previous grazing management due to loss of watering sites, ingress or egress to the allotment, or loss of historic trailing routes. Any of these would require additional management strategies and possible short-term stress on livestock. Forage- and range-improvement projects could be permanently lost as a result of land disposals or exchanges. Loss of AUMs could occur where large blocks of land are either disposed to the public or the land exchange is not in the same area as the allotment losing the land. Many disposal tracts, though, are small and isolated, meaning disposals would not likely result in the loss of desirable allotments. The BLM would be required to notify the permittee two years before any land disposal (43 CFR 4110.4-2[b]), except in an emergency. The BLM would have to compensate the permittees for the range-improvement projects, in accordance with 43 CFR 4120.3-6(c).

Special management areas could impact livestock grazing when they are made unavailable to livestock grazing to protect specific resources. Short-term direct and indirect impacts of developing new Back Country Byways could include loss of forage and temporary displacement of livestock. Long-term impacts on cattle from newly developed Back Country Byway routes include loss of forage and

reduced forage palatability because of dust on vegetation. However, livestock and livestock operators could use Back Country Byways as access routes within or between allotments. When management decisions restrict surface disturbances, construction of structural range improvements could be restricted or limited, as described for VRM classes above. This could limit management options for permittees, which could increase cost or time.

Most ACECs within the decision area would be designated to protect sensitive plant and wildlife habitat and significant cultural resources. Grazing availability depends on the designated ACEC management objectives. Restrictions can include total exclusion of grazing from the ACEC, to the limitations on the kind of livestock animal, to the season, duration, or location that livestock are allowed to graze. Limitations on motorized travel may indirectly impact ability of permittees to access allotments for management. However, limitations on energy and mineral development and ROW authorizations would reduce conflicts of livestock grazing with other resource uses and may improve forage in the long term due to lack of disturbance.

Managing WSAs would have direct and indirect effects on livestock grazing. In general, limitations on surface-disturbing and other disruptive activities would likely reduce harassment of grazing animals and maintain and improve vegetation conditions, thereby maintaining or improving the livestock forage base. Protections afforded to these areas, however, limit the types of access by permittees (such as no OHV use and road closures). Management flexibility could be reduced, as described for special designation areas, above; therefore, permittees' costs to time could increase. Existing range improvements are considered valid rights and could be maintained in the same manner and to the same degree as they have been in the past. The construction of new range improvements would be limited, depending on their impact on wilderness values. WSA management would impose limitations on grazing to protect those wilderness values. If Congress were to release WSAs from wilderness consideration, impacts would vary by alternative and individual WSA.

When portions of grazing allotments overlay river segments eligible or suitable for inclusion in the NWSRS, livestock permittees along these segments could be required to change livestock management, including utilization levels, timing and duration of grazing, or maintaining and constructing range improvements to protect ORVs and adequate water quality to support those ORVs, free-flowing condition, and tentative classification. Restrictions would occur should grazing practices begin to cause degradation compared with the conditions that existed when NWSRS eligibility or suitability was determined. Even under Alternative B (in which none of the segments would be found suitable), segment I ORVs would still be protected through WSA management.

Livestock Grazing: Effects from Climate Management***Effects under Alternative A***

No specific management actions are in place under Alternatives A for climate management. The BLM would continue to address climate management through strategies primarily addressing drought management. Based on drought conditions livestock may not be allowed to graze in areas. Hauling water would facilitate livestock grazing on a case-by-case basis.

Effects under Alternatives B, C, D, and E

Under Alternatives B through E, management would be adapted as needed to remove existing threats that may exacerbate the negative effects from climate change on BLM special status species and ecosystem functions. As a result, changes to grazing systems may require increased time and costs for permittees. However, should forage condition be impacted by changing climate, such changes are likely to be consistent with actions needed to meet Standards for Rangeland Health.

Livestock Grazing: Effects from Soil Resources***Effects Common to All Alternatives***

Under all alternatives, objectives to maintain Standards for Rangeland Health and Guidelines for Grazing Management (BLM version 2, 2012) and Guidelines for Grazing may limit livestock grazing activities in riparian areas, resulting in increased time and costs for management. Similarly, implementation of BMPs and mitigation measures to protect sensitive soils and biological soil crusts may increase management of livestock in these areas resulting in increased time and costs for permittees. Improving vegetation cover and reducing erosion would improve rangeland health and would maintain sustainable grazing.

Effects under Alternative A

Management actions in Alternative A apply specific limits on authorized actions (e.g., not to exceed a 50 percent reduction in ground cover in High Erosion Susceptibility Areas). These actions may result in the limitation in grazing in site-specific locations that are susceptible to high soil erosion should ground cover criteria not be met.

Approximately 206,000 acres within available livestock grazing allotments are considered sensitive soils under Alternative A. Should a 50 percent reduction of ground cover in High Erosion Susceptibility Areas occur, protecting these areas would indirectly impact livestock grazing by increasing time and costs associated with range management.

Effects under Alternative B

Approximately 206,000 acres within available livestock grazing allotments are considered sensitive soils under Alternative B. Management actions to reduce

erosion within areas having high soil erosion potential would improve rangeland health and protect forage.

Effects under Alternative C

Approximately 96,700 acres within available livestock grazing allotments are considered sensitive soils under Alternative C. Management actions to reduce erosion within areas having high soil erosion potential would improve rangeland health and protect forage.

Effects under Alternative D

Approximately 206,000 acres within available livestock grazing allotments are considered sensitive soils under Alternative D. Restrictions on surface uses would impact grazing as described in Alternative C.

Effects under Alternative E

Effects from management of soil resources under Alternative E would be the same as described under Alternative D.

Livestock Grazing: Effects from Water Resources

Effects Common to All Alternatives

Under all alternatives, objectives to maintain satisfactory watershed conditions as indicated by maintenance of riparian proper functioning conditions may limit livestock grazing activities in riparian areas, resulting in increased time and costs for management. Similarly, implementation of BMPs and mitigation measures to protect water quality may increase management of livestock in these areas resulting in increased time and costs for permittees.

Effects under Alternative A

Current impacts from water resources management on livestock grazing would continue under Alternative A.

Effects under Alternative B

Actions to develop water sources or wells, as needed, on BLM-administered lands that can be used for multiple uses, including fire suppression activities, would increase the available water for livestock use, allowing for better ability to disperse cattle, improving livestock access to forage that was previously not available due to lack of water to support livestock. Similarly, actions to develop partnerships and allow water importation projects would potentially result in additional water sources for livestock use. Allowing export of water could impact water quantity available to livestock due to decrease flows of springs or surface water sources.

Effects under Alternative C

Management of priority watersheds would apply use restriction that would protect watersheds, improve forage conditions, maintain range health, and provide sustainable forage for livestock grazing. Impacts from development of

water sources for multiple uses on livestock management would be similar to those described under Alternative B. Management emphasis on wildlife use may result in water available to livestock as well. Providing water for wildlife would increase costs to permittees to pump or maintain range improvements.

Effects under Alternative D

Management of priority watersheds would apply use restriction that would protect watersheds, improve forage conditions, maintain range health, and provide sustainable forage for livestock grazing. Protecting municipal wellheads may restrict grazing within buffer zones. Development of water sources for multiple uses would impact livestock management as described under Alternative B.

Effects under Alternative E

Effects from management of water resources under Alternative E would be the same as described under Alternative D.

Livestock Grazing: Effects from Vegetation Resources

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under Alternative A, rangeland treatments call for maintenance of sufficient quality and diversity of habitat and forage for livestock, wildlife, and wild horses, thus emphasizing treatments to improve forage and ensuring permittees have sufficient quantities of forage to maintain permitted levels of AUMs.

Under Alternative A, management for riparian areas would focus on maintenance of the condition of the riparian habitat with few specific actions impacting livestock grazing.

Effects under Alternative B

Similar to Alternative A, management actions for rangeland habitat emphasize treatments to increase the forage value of the resource, with potential for long-term benefits to forage condition for livestock and increased management options for permittees. Rest periods post treatment are two years at minimum, resulting in temporary impacts on livestock management as described under *Nature and Type of Effects*. Permittees would need to find alternate sources of livestock forage during rest periods.

Conversion of as many as 20,000 acres of low-density pinyon-juniper to sagebrush areas per year and thinning of 6,500 acres medium density woodlands may result in short-term disturbance of grazing activities, but improved forage conditions for livestock allotments within these areas in the long term.

Under Alternative B, in areas found to be in nonattainment of PFC as a result of livestock use, management changes would occur on a site-specific basis and may include exclusion of livestock, which could result in increased time or costs for permittees depending on the extent and quality of the area excluded. The provision to provide alternative water sources when conditions permit would minimize impacts. Revision of grazing management during the periodic review of permitted use in a grazing permit may result in required changes to grazing systems or level of permitted AUMs, which could increase time and costs to permittees; however, implementation of these changes during the periodic review would limit impacts.

Effects under Alternative C

Management actions for rangeland habitat emphasize treatment to restore healthy conditions. While long-term improvements to forage may occur as described under Alternative B, other habitat needs may be emphasized and impacts on forage may be at a lower level. No minimum period is set for rest of treated areas, however, grazing would not be allowed until objectives are met, which may result in a longer term exclusion than under Alternative A and thus increased cost for permittees.

Conversion of as many as 3,500 acres of low-density pinyon-juniper to sagebrush areas per year and thinning of 1,500 acres medium density woodlands may result in short-term disturbance of grazing activities, but improved forage conditions for livestock allotments within these areas in the long term.

Exclusion of livestock grazing while conducting woodland vegetation treatments would result in temporary loss of forage and may result in required changes to season of use and/or maintenance to range improvements, at increased cost to permittees/leases.

Under Alternative C, native plant materials would be emphasized in restoration treatments, however, exceptions would be granted when resource management objectives cannot be met with native species, therefore impacts on livestock grazing management would be minimized.

Prior to restoration treatment in Alternative C, monitoring of currently livestock management would be conducted and utilization levels examined, potentially resulting in change in levels to permitted use. As a result, permittees/leases would be required to move livestock to other pastures, and/or find alternative sources of forage on other public or private lands, in some cases in a short time frame (e.g., within five days in mountain big sagebrush communities), resulting at increased time and costs. In addition, permittee/leases may be required to repair range improvements if found to be contributing to unacceptable livestock use at increased cost to permittees/leases.

Under Alternative C, riparian area management may impact livestock grazing due to exclusion of livestock as described under Alternative A. Under this alternative changes to management may be required as soon as an area is observed to be in noncompliance with PFC. As a result, permittees could be required to reduce AUMs, increase herding or make other changes within the course of a grazing season, resulting in increased costs and time for management. Additionally, application of stipulations to grazing permits when treatments were applied, including but not limited to season of use limitations, utilization rate limits, and fencing, would increase time required for management and may impact the ability to graze at permitted AUM level, resulting in economic costs.

Effects under Alternative D

Treatments in rangeland habitat would emphasize forage improvement with impacts as described under Alternative B. Rest periods and impacts would be as described under Alternative B.

Monitoring of utilization and related impacts would be as described under Alternative C.

Temporary exclusion of livestock from treated areas would result in impacts as described under Alternative C.

Under Alternative D, riparian area management may include exclusion of livestock with impacts as described under Alternative A. Application of stipulation to permits may occur as described under Alternative C.

Effects under Alternative E

Treatments in rangeland habitat under Alternative E would emphasize healthy habitat as under Alternative C. Rest after ESR and rangeland treatments would be a minimum of two growing seasons and may be extended until objectives are met, thereby resulting in a longer term exclusion of grazing from treatment areas as compare to Alternative A, resulting in loss of forage availability and increased costs for permittees.

Monitoring of utilization and related impacts would be as described under Alternative C.

Conversion of as many as 8,500 acres a of low-density pinyon-juniper to sagebrush areas per year and thinning of 6,500 acres medium density woodlands may result in short-term disturbance of grazing activities, but improved forage conditions for livestock allotments within these areas in the long term. Temporary exclusion of livestock from treated areas would result in impacts as described under Alternative C

Under Alternative E, riparian areas management may impact livestock grazing as described under Alternative C. Application of stipulation to permits may occur as described under Alternative C.

Livestock Grazing: Effects from Fish and Wildlife Management

Effects Common to All Alternatives

Implementing habitat improvement projects where necessary to stabilize or improve unsatisfactory or declining wildlife habitat conditions would also improve conditions for livestock grazing. Habitat improvements that include fencing could exclude livestock from grazing, reducing the availability of forage. Under all alternatives, modification of fences may be required to allow for wildlife passage, at potential cost to permittees. Designing water developments to be constructed specifically for wildlife to exclude use from domestic livestock and wild horses and burros would restrict livestock from using alternative water sources.

Effects under Alternative A

Under Alternative A, direct impacts on livestock from wildlife management would be limited and would be similar to those described under *Nature and Types of Effects*.

Effects under Alternative B

Under Alternative B, fences that may inhibit big game movement would be evaluated on a case-by-case basis, with potential for some limited impacts in individual allotments should changes to fencing be required.

Management of priority habitat as a ROW avoidance areas and application of CSU stipulations within 500 feet of lentic and lotic habitat would reduce impacts on wildlife habitat and would protect areas used by livestock. Applying seasonal use restrictions to protect wildlife would also protect rangeland while restrictions are in place.

Under Alternative B, new translocation of bighorn sheep would have no impacts on livestock management as translocation would only be permitted when effective separation is possible, or permittees would not be liable for disease transmission.

Effects under Alternative C

Under Alternative C, the BLM would apply seasonal use restrictions to protect wildlife would also protect rangeland during the time restriction are in place. Alternative C would also apply NSO stipulations for fluid minerals within 500 feet of lentic and lotic habitat and would delineate ROW exclusion areas within priority wildlife habitat areas. Management within these areas would protect rangeland from disturbance and would maintain livestock forage. Under Alternative C, construction of fences that would conflict with big game

movement would be prohibited, with potential for increased herding costs for permittees in cases where fences are desired to contain livestock.

New translocation of bighorn sheep would have no impacts on domestic sheep permittees as described in Alternative B. However, domestic sheep and goat grazing would be limited to areas 9 miles or greater from potential and occupied bighorn habitat; this 9-mile buffer area overlaps with the majority of the planning area. These allotments would require change in kind of livestock, or the permittee would have to find alternative sources for grazing, which would increase grazing management costs.

In general, actions under Alternative C that would limit mineral and energy use in sensitive wildlife habitat would also limit disturbance of forage and conflicts with livestock grazing in these areas.

Effects under Alternative D

Applying seasonal use restrictions to protect wildlife would also protect rangeland during the time restrictions are in place. Impacts relating to management of ROW avoidance areas would be similar to those described under Alternative B. Under Alternative D, the BLM would also apply CSU stipulations within priority habitat areas applicable to fluid minerals within 500 feet of lentic and lotic habitat. Livestock forage within the buffer area would be protected. Under Alternative D, new translocation of bighorn sheep would have no impacts on domestic sheep permittees as described in Alternative B.

Effects under Alternative E

Applying seasonal use restrictions to protect wildlife would also protect rangeland during the time restrictions are in place. Impacts relating to management of ROW avoidance areas would be similar to those described under Alternative B. Under Alternative E, the BLM would also apply NSO stipulations for fluid minerals within 500 feet of lentic and lotic habitats located within priority wildlife habitat areas. Management within these areas would protect rangeland from disturbance and would maintain livestock forage. Under Alternative E, construction of fences that conflict with big game movement corridors would be prohibited, with potential for increased herding costs for permittees in cases where fences are desired to contain livestock.

New translocation of bighorn sheep would have no impacts on domestic sheep permittees as described in Alternative B. Restrictions on domestic sheep and goat grazing would have similar impacts as described under Alternative C, however, under this alternative restrictions would be limited to occupied habitat and would impact fewer allotments.

Livestock Grazing: Effects from Special Status Species Management*Effects Common to All Alternatives*

Designating ACECs to protect sensitive wildlife and plant species would also protect rangeland and provide forage for livestock, except in ACECs that exclude grazing. Management actions to maintain, improve and restore sensitive species habitat would also improve conditions for livestock grazing.

Effects under Alternative A

Under Alternative A, impacts from special status species management would be minimal. Restriction of activities that might be disturbing to sage-grouse between February 15 and May 15 may apply some limitations on livestock grazing, but impacts would likely be limited due to flexibility in management direction in the RMP. Closure of areas to OHV use in order to protect sensitive plants may restrict access to permittees in order to maintain range improvements. Supporting the reintroduction of Lahontan cutthroat trout, bighorn sheep, and other endemic species into suitable, potential and historic habit may affect grazing management practices and increase permittee costs in those allotments where historic habitats are present. Alternative A would manage one ACEC to protect sensitive species (330 acres for Carson wandering skipper habitat) and would also protect rangeland.

Effects under Alternative B

Alternative B proposes designation of four new ACECs to protect habitat for sensitive plants and wildlife. While no ACEC would be proposed for Carson wandering skipper habitat, Carson Wandering Skipper habitat near Winnemucca Ranch Road would be made unavailable for livestock grazing (330 acres). The majority of this area (330 acres) is not available to grazing under Alternative A. If making additional acres unavailable impacted ability of livestock to effectively distribute or obtain sufficient forage, then time and cost for management could increase for livestock permittees in the Paiute Allotment. However, due to the limited acres closed, impacts are likely to be limited. Rehabilitation of PPMA habitat would restrict grazing for a minimum of two annual cycles. Impacts would be similar to those described under *Nature and Types of Effects*. Under Alternative B, actions to improve PPMA/PGMA habitat (414,200 acres available for grazing) may result in some site-specific limitation on grazing management, should for example, exclosures be imposed. Actions to improve habitat conditions may also improve forage in the long term by removing encroaching conifers and reducing catastrophic fire risk. Restrictions within PPMA areas on surface disturbing activities would limit protect sage-grouse habitat and also protect rangeland for livestock grazing.

Time of year and time of day restrictions within 2 miles of Greater Sage-Grouse leks may result in restrictions to livestock management, particularly related to accessing allotments, if access is restricted, costs of management would increase.

Effects under Alternative C

Alternative C proposes designation of 12 ACECS to protect habitat for sensitive plants and wildlife. The Carson Wandering Skipper ACEC would be unavailable to grazing. As described under Alternative B, due to the minimal acres involved (330 acres) and current area unavailable under Alternative A, impacts would likely be minimal. Specific to Greater Sage-Grouse management; all allotments overlapping with PPMA/PGMA would be made unavailable for livestock grazing (414,200 acres). As described under *Nature and Type of Effects*, this action would require permittees to locate alternative sources of forage, often at increased costs. Making large portions of the planning area unavailable represents potentially substantial economic costs for permittees as well as for the community as a whole.

Effects under Alternative D

ACEC management to protect sensitive plant and wildlife species under Alternative D would be the same as described under Alternative B. Carson Wandering skipper habitat near Winnemucca Ranch Road would be unavailable to livestock grazing as described under Alternative B. Under Alternative D, habitat improvement projects would include removal of encroaching junipers in PPMA and PGMA, improving forage quality and reducing fire risk in the long term in these areas (414,200 acres Available for grazing). Restrictions on disturbance and impacts would be similar to that described under Alternative B. Timing limitations would be present within 4 miles of active leks, with potential for limitations to access allotments for management activities as described under Alternative B.

NSO stipulations in PPMA would limit impacts from fluid mineral leasing on rangeland and would protect forage for livestock grazing in this area.

Effects under Alternative E

Under Alternative E, impacts from Greater Sage-Grouse management would be similar to those described under Alternative D. Management of ACECs would be the same as Alternative B. Carson wandering skipper habitat would be unavailable to livestock grazing with impacts as described under Alternative B.

Livestock Grazing: Effects from Wild Horse and Burro Management*Effects Common to All Alternatives*

Managing wild horses and burros in a manner that ensures significant progress is made toward achieving the Standards and Guidelines for Rangeland Health and Wild Horses and Burros, and other site-specific or landscape-level objectives would provide healthy rangeland conditions for livestock. Under all alternatives, management for wild horses and burros at AML or below would limit impacts on rangeland and limit conflicts with livestock for forage resources where wild horse and burro HMAs and livestock grazing allotments overlap. Maintaining or improving HMAs would also improve rangeland for livestock grazing.

Effects under Alternative A

Under Alternative A, 1,196,000 acres in 19 HMAs would overlap areas available for livestock grazing with potential conflicts resulting from competition for available forage and water as discussed in Nature and Type of Effects. Conflict between horses and livestock may occur.

Effects under Alternative B

Under Alternative B, 996,500 acres in 13 HMAs would overlap areas available for livestock grazing. Under Alternative B, prioritization of management for HMAs would emphasize multi-use needs; therefore areas with conflicts between horses and livestock may be prioritized, limiting impacts on livestock. Gathering excess wild horses and burros to achieve a thriving natural ecological balance would ensure rangeland conditions are maintained for both wild horses and burros and livestock.

Effects under Alternative C

Under Alternative C, 427,200 acres in 9 HMAs would overlap areas available to livestock grazing (64 percent less than Alternative A). The BLM would manage HMAs to ensure a thriving natural ecological balance is maintained but would allow for potential increases in AMLs if forage resources would allow, with potential for increased conflicts and competition for forage and water with livestock grazing. Under this alternative, removal of horses from Lahontan HMA due to the lack of water would reduce any conflict with livestock for water in this area.

Effects under Alternative D

Under Alternative D, 996,500 acres in 13 HMAs would overlap areas available for livestock grazing. Under Alternative D, management for wild horses would achieve a thriving natural ecological balance of resources for wild horse and burros with other resource uses and values; therefore, impacts on livestock grazing would be limited. Management actions also allow for removal of wild horses and burros from other allotments during drought emergencies, further limiting conflicts between livestock and horses for limited water sources.

Effects under Alternative E

Under Alternative E, 1,070,200 acres in 12 HMAs would overlap areas available for livestock grazing. Management would emphasize a thriving natural ecological balance between rangeland health and multiple use as described under Alternative D. Ability to remove horses above AML during drought would occur as under Alternative D. No AML increase would be allowed without coordination with Lahontan state park for water and forage, limiting additional conflicts.

Livestock Grazing: Effects from Wildland Fire Ecology and Management*Effects Common to All Alternatives*

Under all alternatives, ESR and other rehabilitation projects would be prioritized to stabilize soils, re-establish hydrologic function, maintain and enhance biological integrity, promote plant resiliency, limit expansion or dominance of invasive species, and reestablish native species. Impacts from fire management are described under *Nature and Type of Effects* with level of impacts varying by treatments allowed and suppression priorities. ESR treatments would restrict grazing in the short term in areas that have burn but would re-establish forage overtime for livestock.

Effects under Alternative A

Under Alternative A, the planning area would be divided into fire management categories with different degrees of fire suppression. Short-term and long-term impacts on livestock forage as a result of fire would vary under these management areas. Alternative A would provide for a full range of fire management suppression and fuel treatment activities (as outlined in the fire management plan) and options would be utilized to protect all identified values at risk. Fire suppression operations would be the most effective having the highest potential for limiting wildland fire size. Fewer rangeland acres would burn maintaining forage for livestock. However, there would be more disturbances from suppression operations on rangeland. Fuel treatments would protect rangeland by potentially slowing the spread of wildfire and would improve vegetation conditions on rangelands in the long term.

Effects under Alternative B

Impacts would be similar to those described Alternative A. Under Alternative B, wildfire, prescribed fire, and nonfire fuels treatments would all be permitted to protect and modify vegetation communities to achieve condition class, fuels, habitat, watershed, and riparian objectives. As a result, a full range of management options would be available for promoting healthy forage.

Effects under Alternative C

Under Alternative C, minimum impact suppression techniques would be emphasized to limit disturbance from suppression activities, but these techniques may also hinder effective suppression operations. The potential for larger wildfires would occur under this alternative. Fuels treatments to maintain, protect, and expand healthy resilient vegetative ecosystems would be emphasized, potentially limiting treatments to increase forage resources.

Effects under Alternative D

Under Alternative D, emphasis on protecting WUI values from catastrophic fire would increase the risk of larger fires in areas outside of the WUI. More impacts on forage resources would occur in rangeland outside of WUI areas.

Effects under Alternative E

Impacts from suppression activities would have similar impacts as discussed under Alternative B.

Livestock Grazing: Effects from Cultural Resources Management*Effects Common to All*

Requirements to inventory areas prior to implementation of range improvement projects could affect the location of fences and other improvements in order to avoid impacts to cultural resources.

Effects under Alternative A

Under Alternative A, few site-specific limitations for cultural resources would be in place, limiting impacts on livestock grazing. Alternative A would manage one ACEC to protect cultural resources. Protective management would also protect rangeland and provide forage for livestock.

Effects under Alternative B

Under Alternative B, implementation of protective measures for TCPs (including ROW avoidance and CSU limitations for fluid minerals) as well as 0.25-mile buffer for ROW avoidance for historic roads and trails, and protection measures within 0.125 miles of rock art, would mitigate impacts and limit disturbance. Impacts on rangeland would also be reduced. Alternative B would propose 8 ACECs to protect cultural resources. Protective management would also protect rangeland within the ACECs and provide forage for livestock. More rangeland would be protected compared to Alternative A.

Effects under Alternative C

Under Alternative C, implementation of protective measures for TCPs (including ROW exclusion, NSO stipulations, and closure to mineral material sales and CSU limitations for fluid minerals) as well as 2.5-mile buffer for ROW avoidance for historic roads and trails and protection measures within 1 mile of rock art, would protect cultural resources through use restrictions and implementation of mitigation measures to reduce surface disturbance. Rangeland values would also be protected. Alternative C would propose 9 ACECs to protect cultural resources. Protective management would also protect rangeland within the ACECs and provide forage for livestock. This alternative would protect the largest area of rangeland through cultural resource management.

Effects under Alternative D

Under Alternative D, implementation of protective measures for TCPs, historic roads, and rock art would be as describe under Alternative B. Alternative D would propose 6 ACECs to protect cultural resources. Protective management would also protect rangeland within the ACECs and provide forage for livestock.

Effects under Alternative E

Under Alternative E, implementation of protective measures for TCPs (including ROW avoidance and NSO stipulations) as well as a 1-mile buffer of ROW avoidance for historic roads and trails and protection measures within 0.5 miles of rock art, would protect cultural resources through use restrictions and implementation of mitigation measures to reduce or limit surface disturbance. Rangeland values would also be protected. Alternative E would propose 3 ACECs to protect cultural resources. Protective management would also protect rangeland within the ACECs and provide forage for livestock.

Livestock Grazing: Effects from Visual Resources Management*Effects Common to All Alternatives*

Impacts of visual resources are as discussed in *Nature and Type of Effects*, with the highest level of impacts on grazing management in VRM Class I and II areas. VRM classes in areas available for livestock grazing are displayed below in **Table 4-15**, VRM Class in Areas Available for Livestock Grazing.

Table 4-15
VRM Class in Areas Available for Livestock Grazing

	A	B	C	D	E
Class I	540,200	540,200	302,900	540,200	540,200
Class II	36,300	51,100	300,800	59,100	480,200

Sources: BLM GIS 2014a, BLM GIS 2014b

Effects under Alternative A

Under Alternative A, 576,500 acres of Class I and II VRM areas overlap with areas available for livestock grazing. Within these areas, disturbance or visual intrusions from range improvement projects would be mitigated by modifying projects to achieve VRM class objectives. The type of improvement, the location, or other factors to reduce impacts to viewsheds would potentially increase time and costs for permittees.

Effects under Alternative B

Under Alternative B, 591,300 acres of Class I and II VRM areas overlap with areas available for livestock grazing. Impacts in overlapping areas would be as described in Alternative A.

Effects under Alternative C

Under Alternative C, 603,700 acres of VRM Class I and II areas overlap with areas available for livestock grazing. Many fewer acres available for livestock grazing would be managed under this alternative. The potential for limiting range improvements and increasing costs to permittees would be the highest under this alternative.

Effects under Alternative D

Under Alternative D 599,300 acres of VRM Class I and II areas overlap with areas available for livestock grazing. Impacts would be similar to those described under Alternative B.

Effects under Alternative E

Under Alternative E, 1,020,400 acres of VRM Class I and II areas overlap with areas available for livestock grazing. Impacts on livestock grazing would be greater than Alternatives A and B but less than Alternative C.

Livestock Grazing: Effects from Livestock Grazing Management

Effects Common to All Alternatives

Under all alternatives, management would comply with the Approved Standards and Guidelines for livestock grazing, and manage all allotments toward meeting Rangeland Health Standards, which could necessitate changes to grazing management at increased time and costs for permittees.

Effects under Alternative A

Under Alternative A, the current level of acres available for livestock grazing (4,796,600) and permitted AUMS (151,200) would be retained. Adjustments to permitted use would occur during a periodic review or an approximate 10-year cycle.

Not providing forage banks under Alternative A could take away an opportunity to help permittees continue to graze their livestock on BLM-administered lands when their own allotment is closed due to an emergency situation, negatively impacting the permittees financially.

Lack of restriction on year-round grazing would provide management options for permittees, but may contribute to failure of allotments to meet land health standards if forage resources become limited and adjustments are not made to grazing practices, with long-term impacts on ability to graze to permitted AUM levels.

Effects under Alternative B

Alternative B would result in approximately 4,797,200 acres available for livestock grazing (less than 1 percent change from Alternative A) and 151,200 permitted AUMS.

Under Alternative B, retaining of allotments overlapping the Pinenut HMA would minimize costs to permittee associated with locating alternative grazing locations, but would retain the potential for conflict between wild horses and livestock, particularly in drought years, when forage would be more limited.

Permittees would consider conversion of cattle grazing to sheep where there is no evidence of disease transmission; this would allow for management options for permittees.

Year-round grazing would not be allowed in any one allotment, allowing for some management options for permittees who can transfer livestock to alternative pastures, limiting impacts on land health in any one area.

Allowance of prescriptive grazing would provide potential for additional forage in specified areas, however, due to short-term usage, would not represent substantially increased opportunities for livestock permittees. Potential to allow protein supplementation may also provide management opportunities for permittees, but would be available on a limited basis with special permit, therefore impacts would be minimized. Prescribed grazing would reduce the intensity and spread of wildfire in certain areas and vegetation communities.

Under Alternative B, allotments would be closed where management changes have failed to stop decreasing in ecological function due to livestock. As a result, permittees on the specified allotments would be required to temporarily relocate livestock to other pastures/allotments within CCD or on other public or private lands, often at increased costs.

Effects under Alternative C

Alternative C would result in approximately 2,702,000 acres (56 percent reduction from Alternative A) available for livestock grazing and 40,700 permitted AUMs (approximately 73 percent change from Alternative A). In addition, under Alternative C, reduction in AUMs may be required on allotments not meeting land-health standards. Under drought or other emergency situation, temporary closure of allotments would also occur as needed under this alternative.

As discussed under Nature and Type of impacts, reduction in permitted AUM levels may result in economic impacts for both individual permittees and the local economy as a whole, dependent on the level of AUM reduction and the importance of grazing in the local economy. Permitted AUM level is approximant, based on acres made unavailable for livestock grazing. Actual number of permitted AUMs in a given allotment would be determined at implementation. In cases where the majority of an allotment is closed permittees may determine that grazing on that allotment is no longer economical. Conversely, when only a small percentage of an allotment is made unavailable, permittees may be able to change management practices such that AUM reduction is not needed. Economic impacts of grazing are discussed further in **Section 4.6.4**, Social and Economic Conditions.

No continuous grazing would be allowed on an allotment basis, limiting management opportunities for livestock permittees, particularly for smaller scale

operators who do not have access to multiple pastures or allotments within the planning area.

Under Alternative C, allotments would be unavailable for livestock grazing once they become vacant. As weather and precipitation levels as well as market conditions are variable, this may result in the closure of allotments after one season on non-use due to conditions outside of the permittees control. Closure of allotments would result in increased time and costs for permittees and may impact the local economy as a whole if alternative grazing areas are not located.

Under Alternative C, livestock grazing in the Pinenut HMA would be made unavailable to grazing once they become vacant, reducing conflicts between wild horses and livestock and associated management costs to permittees.

Prohibition of prescriptive grazing would not provide additional opportunities for livestock permittees.

Allowance of conversion of cattle permits to sheep/goat permits would allow for options in management but only where consistent with bighorn sheep management, limiting opportunities.

Alternative C would have the highest potential to reduce permittee income and to increase livestock management costs as fewer acres would be available for livestock grazing, and permitted AUMs would be the lowest compared to other alternatives. Many livestock operations may not be sustainable under this alternative.

Effects under Alternative D

Alternative D would result in approximately 4,792,600 acres available for livestock grazing (less than 1 percent change from Alternative A) and 150,800 permitted AUMS (1 percent change from Alternative A). Management for grazing would be similar to Alternative A, with adjustment every 10 years or on a case-by-case basis (whichever is less) during the periodic review of permitted use for a grazing permit.

As under Alternative C, temporary closure of allotments during emergency situations could improve rangeland health in the long term but has potential for a high level of impacts in the short term.

Year-round grazing would be permitted with impacts as described under Alternative B.

Allotments where management changes have been implemented and the allotment is still decreasing in ecological function would be unavailable for livestock grazing. Impacts would be similar to those described under Alternative B. Under D, however, closures would be extended to areas where livestock use is incompatible with urban uses, with potential for additional impacts on

livestock permittees if alternative pastures cannot be located or if closures resulted in the need for more intensive management such as herding, movement to alternative pastures, or addition or improvement of structural range improvements.

Impacts from making Pinenut allotments unavailable to livestock grazing would be as described under Alternative C.

Allowance of prescriptive grazing would provide additional opportunities for permittees.

Potential for use of vacant allotments as a forage base may provide additional management options long term for leases/permittee.

Allowing conversion of allotments from cattle to sheep/goats represents management options for permittees, especially where urban interface issues are not consistent with cattle grazing. However, options would be limited by requirements to follow bighorn sheep management objectives.

Although management actions relating to other alternatives are included under Alternative E, the degree of overall impacts would be similar to those described under Alternative A but with more livestock management restrictions that would increase costs for permittees.

Effects under Alternative E

Alternative E would result in approximately 4,797,200 (same as Alternative B) acres available for livestock grazing and 151,200 permitted AUMs. Periodic review and adjustment would be conducted as described under Alternative D. Temporary closure may occur with impacts as described under Alternatives C and D.

Year-round grazing would be allowed where allotments have shown ability to meet land health standards under current year long use. This system would allow management opportunities for permittees who have demonstrated responsible grazing practices and limit costs to these permittees while maintaining land health.

Alternative E actions to close allotments to livestock grazing would be similar to those discussed under Alternative B but would include closures when allotments fail to reach other defined objectives. This would result in an increased level of impacts on permittees. Adjustment to allotments would be considered when not compatible with urban uses, resulting in potential for increased management by permittees, but reducing conflicts between livestock grazing use and other resource users. Vacant allotments would be assessed for forage bank suitability with impacts as discussed under Alternative D.

Impacts from retaining allotments in Pinenut HMA would be as discussed under Alternative B.

Prescriptive grazing would be allowed with impacts as described under Alternative B; however, grazing would only be allowed in urban interface areas, reducing impacts.

Conversion of livestock kind would have impacts as described under Alternative D.

Impacts would be similar to Alternative D but with more AUMs permitted.

Livestock Grazing: Effects from Geology and Mineral Management

Effects Common to All Alternatives

Under all alternatives, impacts from fluid mineral management, exploration, and development would cause surface disturbance and removal of rangeland vegetation reducing forage available to livestock. Development could close off area available to livestock grazing further reducing availability of forage. Impacts would be minimized by CSU, NSO and other restrictions. Areas available for livestock grazing and open to fluid mineral leasing and those open with stipulations are shown in **Table 4-16**, Area Available for Livestock Grazing and Fluid Mineral Leasing.

Table 4-16
Area Available for Livestock Grazing and Fluid Mineral Leasing

	A	B	C	D	E
Indicator					
Open to fluid mineral leasing	3,962,500	4,029,000	1,477,100	4,060,800	3,790,300
Open with NSO stipulations	700	404,600	693,400	864,300	1,150,600
Open with CSU stipulations	0	2,119,700	641,500	2,071,000	1,844,900

Sources: BLM GIS 2014a, BLM GIS 2014b

Impacts on grazing from locatable mineral development include removal of vegetation to conduct exploration and develop mines. Removal of vegetation would reduce forage available to livestock. Impacts would be dependent on the size and location of surface disturbing activities. Mitigation measures to reduce impacts would be developed during site-specific permitting and NEPA analysis. For all alternatives 193,000 acres would be closed to mineral entry and no impacts would occur to livestock grazing from locatable development in these areas.

Impacts from mineral material development would be limited under all alternatives due to relative small disturbance footprints of gravel pits.

Effects under Alternative A

Under Alternative A, the majority of the planning area (3,962,500 acres) would continue to be open to fluid mineral development and available to livestock grazing, with potential for disturbance from geothermal development as described under *Nature and Type of Effects*.

Effects under Alternative B

Under Alternative B, while the level of area open to fluid mineral development and available to livestock grazing would increase slightly (4,029,000 acres), additional restrictions on surface disturbance (as shown in **Table 4-16**) would limit impacts on grazing from geothermal development.

Effects under Alternative C

Under Alternative C, the highest level of closures and restriction on fluid mineral development would be in place, decreasing the disturbance from development compared to Alternative A (see **Table 4-16**). Due to the emphasis on restoration of lands disturbed by mineral operations would provide potential for additional protections for rangeland and provide forage in the long term.

Effects under Alternative D

Under Alternative D, impacts would be similar to that described under Alternative B. Increased NSO restrictions would further mitigate impacts of development on livestock. As under Alternative C, restoration of lands disturbed by mineral operations would provide potential for additional forage in the long term.

Effects under Alternative E

Under Alternative E, impacts would be similar to that described under Alternative B. As under Alternative C, restoration of lands disturbed by mineral operations would provide potential for additional forage in the long term.

Livestock Grazing: Effects from Recreation and Visitor Services*Effects Common to All Alternatives*

Under all alternatives, disturbance of livestock grazing and forage may occur from dispersed recreation, Special Recreation Activities and within ERMA and SRMA as discussed in *Nature and Type of Effects*. Special Recreation permits would be issued under all alternatives with potential conflicts with recreation when events occurred in areas with livestock grazing. Level of impacts from ERMA and SRMA varies by alternative as described below.

Effects under Alternative A

Approximately 62,600 acres of available grazing areas would be located within 2 SRMA under Alternative A. Impacts on grazing may result from fencing or development of facilities reducing availability of livestock forage. Increase public visitation may stress livestock and change grazing patterns on rangeland. No

ERMAs would be established under Alternative A but dispersed recreation is expected to continue, with conflicts between recreation and livestock grazing as discussed under *Nature and Type of Effects*.

Effects under Alternative B

Approximately 58,400 acres of available grazing areas would be located in 6 SRMAs. Within the Alpine SRMA (emphasizing non-motorized recreation), permittee access to allotments and herding may be impacted. In Dead Camel Mountains, Hungry Valley, San Mountain, Walker Lake, and Wilson Canyon SRMAs disturbance from motorized recreation could increase disturbance and unwanted dispersal of livestock as described under *Nature and Type of Effects*.

The BLM would manage an additional 1,653,800 acres of available grazing areas as ERMAs with impacts as described under *Nature and Type of Effects*.

Effects under Alternative C

Under Alternative C, approximately 36,000 acres available for grazing would be located in 2 SRMAs. Under Alternative C, the emphasis of SRMAs is on non-motorized recreation and therefore impacts would focus on restrictions to access of allotments and herding. The BLM would manage an additional 491,100 acres as ERMAs.

Effects under Alternative D

Under Alternative D, approximately 49,100 acres available for grazing would be located in 4 SRMAs, a less than one percent change from Alternative A. Impacts from motorized recreation would be similar to discussed in Alternative B for Dead Camel Mountains, and Wilson Canyon and Hungry Valley SRMA, however, some limitations on travel to routes and development of route systems would decrease level of conflicts with grazing. The BLM would manage an additional 273,000 acres as ERMAs with impacts as discussed under *Nature and Type of Effects*. Impacts would be similar to Alternative A, but with higher impacts on range resources from management of SRMAs.

Effects under Alternative E

Under Alternative E, approximately 88,400 acres available for grazing would be located in 6 SRMAs, the most of any alternative. The BLM would manage an additional 2,026,800 acres as ERMAs, the most of any alternative. Impacts would be similar to those described under Alternative B; however, under Alternative E the increased area managed as SRMAs and ERMAs would increase the potential for conflicts with grazing in these recreation focused areas, but may decrease the overall level of conflicts with dispersed recreation in the planning area. This alternative has the highest potential to affect livestock management as the number and size of SRMAs would increase both public visitation and development of recreational facilities, which would reduce forage or access to forage.

Livestock Grazing: Effects from Comprehensive Travel and Transportation Management

Travel management designations in areas available for livestock grazing are shown in **Table 4-17**, Travel and Transportation Management in Areas Available for Livestock Grazing, below.

Table 4-17
Travel and Transportation Management in Areas Available for Livestock Grazing

	A	B	C	D	E
Open to unrestricted vehicle use	3,840,300	95,300	0	22,700	55,700
Limited to Existing routes	917,800	4,671,400	1,632,000	4,797,900	4,711,500
Closed to motorized, limited to existing for mechanized	31,800	26,400	356,100	30,600	24,100
Closed to motorized and mechanized	6,700	4,000	113,200	1,400	6,000

Sources: BLM GIS 2014a, BLM GIS 2014b

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under Alternative A, 3,840,300 acres would be open to unrestricted travel, the most of any alternative. Impacts from OHV such as disturbance, dust, and noise, use as described under *Nature and Type of Effects* would be highest under this alternative. Access to permittee allotments for management would not be restricted.

Effects under Alternative B

Under Alternative B, 95,300 acres available for livestock grazing would be designated as open (97.5 percent reduction compared with Alternative A), with the majority of this area changes to limited to existing routes. As discussed under *Nature and Type of Effects*, changing motorized vehicle use areas from an open to a limited designation would affect livestock grazing by reducing disturbance from multiple uses on grazing allotments but could also impact permittees that use OHVs to access allotments or herd cattle. Exceptions for authorized use such as accessing allotments may be granted, which could lessen the impacts from changing OHV designations from open to limited.

Effects under Alternative C

Under Alternative C, no areas available for livestock would be open to unrestricted travel. Areas open to existing trails would be decreased due to the decrease in areas available for livestock grazing overall. Areas closed to motorized use would be substantially increased compared to Alternative A (see **Table 4-17**) with impacts as discussed under Alternative B and *Nature and Type of Effects*.

Effects under Alternative D

Under Alternative D, 22,700 acres available for livestock grazing would be designated as open (99.4 percent reduction compared with Alternative A), with the majority of this area changes to limited to existing routes. Impacts would be similar to those discussed under Alternative B and *Nature and Type of Effects*.

Effects under Alternative E

Under Alternative E, 55,700 acres available for livestock grazing would be designated as open (98.5 percent reduction compared with Alternative A), with the majority of this area changes to limited to existing routes. Impacts would be similar to those discussed under Alternative B and *Nature and Type of Effects*.

Livestock Grazing: Effects from Lands and Realty*Effects Common to All Alternatives*

As discussed under *Nature and Type of Effects*, under all alternatives, allowing ROW authorization and development would increase disturbance of livestock grazing. Level of disturbance is determined by ROW exclusion and avoidance areas, as shown in **Table 4-18**, Lands and Realty Actions in Areas Available for Livestock Grazing, below. In addition, disposal of lands under all alternatives has potential to increase lands available for grazing or, if containing current allotments, decrease forage available. Level of impacts would be determined by the size, quality and location of disposed lands.

Table 4-18
Lands and Realty Actions in Areas Available for Livestock Grazing

	A	B	C	D	E
Indicator					
ROW Exclusion	564,000	580,000	1,007,600	564,100	605,900
ROW Avoidance	0	1,038,800	228,200	1,219,900	1,447,300
Lands identified for Disposal	178,800	273,500	0	332,500	266,300

Sources: BLM GIS 2014a, BLM GIS 2014b

Effects under Alternative A

Under Alternative A, the BLM would manage 564,000 acres Available for livestock grazing as ROW exclusion areas. As discussed under *Nature and Type of Effects*, these areas would have a decreased chance of development and associated disturbance to livestock forage and management activities.

Effects under Alternative B

Under Alternative B, 1,038,800 acres would be maintained as ROW avoidance and 580,000 acres as ROW exclusion areas (3 percent more than Alternative A) in areas available for livestock grazing. As a result, disturbance of livestock from development would decrease compared to Alternative A. Acquiring lands in Washoe County may provide additional forage. Retaining and acquiring lands within PPMAs and PGMA may result in additional lands for livestock grazing,

but these lands would have limitations on grazing management in order to protect Greater Sage-Grouse. Exact level of impacts would be determined only when site-specific parcels disposed. Impacts would be minimized by following BLM criteria for disposal.

Effects under Alternative C

Under Alternative C, 228,200 acres would be maintained as ROW avoidance and 1,007,600 acres as ROW exclusion areas. As a result, disturbance of livestock from development would decrease compared to Alternative A. Acquisition of Greater Sage-Grouse occupied habitat would not provide additional lands for grazing, as these areas would be made unavailable for livestock grazing. No lands are identified for disposal, so no forage would be lost to disposal.

Effects under Alternative D

Under Alternative D 1,219,900 acres would be maintained as ROW avoidance and 564,100 acres as ROW exclusion areas (nearly the same as Alternative A) in areas available for grazing. As a result, disturbance of livestock from development would decrease compared to Alternative A. Disposal of 332,500 acres (86 percent more than Alternative A) would have potential impacts as discussed under *Nature and Type of Effects*. An additional 4,870 acres would be designated for disposal to state and local government through the Recreation and Public Purposes Act, however these lands would remain available for livestock leasing under the Taylor grazing act, section 7, minimizing impacts.

Effects under Alternative E

Under Alternative E, 1,447,300 acres would be maintained as ROW avoidance and 605,900 acres as ROW exclusion areas (7 percent more than Alternative A) in areas available for grazing. As a result, disturbance of livestock from development would decrease compared to Alternative A. Impacts from disposal and acquisition of lands would be similar to that discussed under Alternative D.

Livestock Grazing: Effects from Renewable Energy

Effects Common to All Alternatives

Under all alternatives, the greatest level of impacts comes from potential development of geothermal resources which is managed under fluid minerals. While potential for solar and wind development is present, development has been limited in the planning area to this point. Greatest potential for development occurs in solar variance areas and potential for development from wind energy is decreased in wind ROW avoidance areas which vary by alternative.

Effects under Alternative A

Under Alternative A, potential for disturbance of livestock forage and cattle grazing occurs from areas available for solar variance areas (905,300 acres available for livestock grazing). No wind specific ROW avoidance areas would

be established; therefore impacts could occur from wind energy development throughout the planning area where the resource is present.

Effects under Alternative B

Under Alternative B, potential for disturbance of livestock forage and cattle grazing occurs from areas available for solar variance areas (722,900 acres Available for livestock grazing 20 percent less than Alternative A). Wind development and related disturbance to livestock would be decreased in the wind ROW avoidance areas (1,220,200 acres).

Effects under Alternative C

Under Alternative C, wind development and related disturbance to livestock would be decreased in the wind ROW exclusion areas (638,400 acres). Overall, impacts from renewable energy development would be decreased due to fewer acres available for livestock grazing under this alternative.

Effects under Alternative D

Under Alternative D, potential for disturbance of livestock forage and cattle grazing occurs from areas available for solar variance areas (671,500 acres Available for livestock grazing, 26 percent less than Alternative A). Wind development and related disturbance to livestock would be decreased in the wind ROW avoidance areas (1,223,100 acres).

Effects under Alternative E

Under Alternative E, potential for disturbance of livestock forage and cattle grazing occurs from areas available for solar variance areas (629,400 acres Available for livestock grazing 29 percent less than Alternative A). Wind development and related disturbance to livestock would be decreased in the wind ROW avoidance areas (629,400 acres).

Livestock Grazing: Effects from Areas of Critical Environmental Concern

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under Alternative A, all 16,800 acres of the 6 existing ACECs would be available for livestock grazing. In these areas, restrictions on grazing would vary depending on the resource for which the ACEC was designated, with impacts as described under *Nature and Type of Effects*.

Effects under Alternative B

Under Alternative B, 287,700 acres of the 13 ACECs (371,170 total acres) would be available for livestock grazing, and 6,100 total acres would be made unavailable for grazing. The types of impacts from management of the ACECs available for livestock grazing are the same as those described under *Nature and*

Types of Effects, but they would occur over a larger area than under Alternative A.

Effects under Alternative C

Under Alternative C, 21,200 acres of the 21 ACECs (786,270 total acres) would be available for livestock grazing (3 percent more than Alternative A), and 2,702,000 total acres would be made unavailable for grazing. The types of impacts from management of the ACECs available for livestock grazing are the same as those described under *Nature and Types of Effects*. Under this alternative, direct impacts on grazing are increased due to the closure of Greater Sage-Grouse habitat to grazing, as well closures of other ACECs for resource protection.

In addition to closures, seasonal restrictions for grazing in place for the 109,200 acres of the Virginia Mountains Greater Sage-Grouse ACEC, Clan Alpine Greater Sage-Grouse ACEC (98,400 acres), Desatoya Greater Sage-Grouse ACEC (105,058 acres), Pine Nut Bi-State Sage Grouse ACEC (100,400 acres) would place seasonal limitations on livestock grazing, which may require adjustments to grazing rotations and season of use, with increased time and cost for permittees. Similarly, restrictions on OHV use will limit ability of permittees to access allotments for management.

Fencing of the Dixie Valley Toad ACEC (410 acres) to exclude cattle would impose limitations on management but overall impacts likely minimal due to small size of the closure.

Closures to motorized use in the Greater Sand Mountain ACEC (17,000 acres) could limit ability of permittees to access allotments for management.

Effects under Alternative D

Under Alternative D, 174,500 acres of the 11 ACECs (180,000 total acres) would be available for livestock grazing, and 10,700 total acres would be unavailable for grazing. The types of impacts from management of the ACECs available for livestock grazing are the same as those described under *Nature and Types of Effects*, but they would occur over a larger area than under Alternative A.

Effects under Alternative E

Under Alternative E, all 82,800 acres of the 8 ACECs would be available for livestock grazing. The types of impacts from management of the ACECs available for livestock grazing are the same as those described under *Nature and Types of Effects*, but they would occur over a larger area than under Alternative A.

Livestock Grazing: Effects from Back Country Byways

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under Alternative A, impact of the existing Fort Churchill Back Country Byway would be as described under *Nature and Type of Effects*.

Effects under Alternative B

Under Alternative B, maintenance and expansion of Fort Churchill Back Country Byway and development of the Marietta and New Pass Hawthorne Back-County By-ways would result in potential disturbance from increased visitation as discussed under *Nature and Type of Effects*.

Effects under Alternative C

Impacts from the development of Marietta and New Pass Hawthorne Back Country Byways would be as described under *Nature and Type of Effects*. Declassification of the Fort Churchill byway would decrease visitation and related disturbance in that area.

Effects under Alternative D

The BLM would manage no Back Country Byways in the planning area under Alternative D, reducing the impacts on livestock grazing than under Alternative A.

Effects under Alternative E

Impacts would be as described under Alternative B.

Livestock Grazing: Effects from Wild and Scenic Rivers

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under Alternative A, eligible river corridors overlapping with areas available for livestock grazing would be given protection either through continued interim protective management with impacts as described under *Nature and Type of Effects*.

Effects under Alternative B

Under Alternative B, eligible segments in the East Fork of the Carson River would be released from consideration in the WSR system. Potential for restrictions on grazing in this area would be reduced.

Effects under Alternative C

Under Alternative C, eligible segments in the East Fork of the Carson River would be determined suitable for WSR Inclusion, minimizing disturbance from development in this area and potentially limiting grazing management should current practices impact ORVs. Management of segment 2 as recreational may result in increased visitation in this area, with potential for increases in unwanted dispersal of cattle due to gates left open by recreational users.

Effects under Alternative D

Under Alternative D, eligible segments in the East Fork of the Carson River would be determined suitable for WSR Inclusion with impacts as described under Alternative C. Management of segments 2 and 3 as recreational may result in increased visitation in this area, with potential for increases in unwanted dispersal of cattle due to gates left open by recreational users.

Effects under Alternative E

Under Alternative E, eligible segments in the East Fork of the Carson River would be determined suitable for WSR Inclusion with impacts as described under Alternative C.

Livestock Grazing: Effects from Wilderness Study Areas*Effects Common to All Alternatives*

Under All Alternatives, WSAs are managed in accordance with Manual #6330 Management of Wilderness Study Areas (BLM 2012e). WSAs are managed under federal non-discretionary guidelines which limit motorized travel, close areas to mineral leasing, and manage them as VRM Class I. Impacts while managed as a WSA would be as described under *Nature and Type of Effects*.

Effects under Alternative A

Should WSAs be released from wilderness consideration, no special management would apply to the 564,000 acres available for livestock grazing currently managed as WSAs, as a result disturbance to rangeland from other resource uses could increase, however, ability to construct range improvements and access allotments would have fewer restrictions imposed.

Effects under Alternative B

Under Alternative B, the BLM would manage the 564,000 acres available for livestock grazing as WSAs. Should WSAs be released from wilderness consideration disturbance to rangeland from other resource uses could increase. Under Alternative B, the BLM would manage 7 WSAs as VRM Class II, with some potential for limitations on structural range improvements in these areas.

Effects under Alternative C

Under Alternative C, the BLM would manage the 106,400 acres available for livestock grazing as WSAs. WSAs would be closed to all motorized and

mechanized travel, further limiting the ability of permittees to access allotments for management. Should WSAs be released from wilderness consideration, limitations on mineral leasing, ROW development and SRPs would maintain a low level of disturbance from development and recreation, limiting conflicts. However, range improvements would not be permitted which could result in the need to increased herding and/or altered management systems at a higher cost to permittees.

Effects under Alternative D

Under Alternative D, the BLM would manage the 564,000 acres available for livestock grazing as WSAs. Should WSAs be released from wilderness consideration impacts would be as described under Alternative C, however, some level of development may be permitted therefore some disturbance could occur and range improvements are restricted rather than prohibited, therefore impacts on grazing management would be reduced.

Effects under Alternative E

Under Alternative E, the BLM would manage the 564,000 acres available for livestock grazing as WSAs. Impacts would be as described under Alternative D.

Livestock Grazing: Cumulative Effects

Past and Present Actions

Past and present actions in the cumulative impacts analysis area impacting livestock grazing management include vegetation treatments; mineral, renewable energy, and lands and realty development activities; recreation; wild horse and burro management; and habitat management for special status species.

Vegetation treatments on public and private rangelands to improve forage conditions and treat nonnative and invasive species have impacted forage availability. Treatments in riparian areas to achieve proper functioning condition can result in site-specific exclusion of livestock; assessments show that the majority of riparian areas are not in proper functioning condition. The number of authorized AUMs has fluctuated due to adjustments based on monitoring data and from temporary closures necessitated by insect outbreaks, fire, and drought. Minerals, lands and realty, and renewable energy developments have contributed some minor impacts on grazing due to ground disturbance and/or exclusion of forage when rangelands are fenced in order to protect infrastructure. Recreation has affected grazing management principally due to gates being left open or vandalism of range improvements. Management of sensitive species habitat has limited the degree or intensity of grazing in areas containing special status species habitat in site-specific locations where grazing has been limited or excluded to protect these species. Wild horses and burros compete with livestock for forage, limiting forage availability for livestock in HMAs where AMLs are exceeded and requiring permittees to adjust grazing management strategies. Wildfire has historically removed forage available for

livestock grazing. Impacts have varied based on the size and intensity of wildfires. ESR treatments have helped restore forage for livestock over time.

Reasonably Foreseeable Actions

Reasonably foreseeable future actions are likely to have similar impacts on the past and present actions. Grazing on private lands within the Cumulative Impact Analysis Area (CIAA) is expected to remain stable or slightly decrease as residential development increases and demand for grazing on public lands will be retained. Disposal or other land tenure adjustment of BLM-administered lands for local community use may reduce the availability of public grazing lands, increasing demand for the remaining area. On-going mineral exploration and development and geothermal development as described in Table 4-1, Past, Present, and Reasonably Foreseeable Projects, Plans, or Actions that Make up the Cumulative Impact Scenario, have the potential to impact grazing by reducing forage when livestock grazing access is restricted as well as when project activities result in surface disturbance. Similarly, ROW grants for solar development could result in a decrease in availability of forage due to disturbance of lands. With a projected increase in population, unwanted dispersal from gates left open and other conflicts with recreation are likely to increase. Increased population in the WUI may also increase the risk of wildfire, or shift resources from rangelands to protect private property. However, proposed fuels management projects would reduce fire size or spread and reduce the number of acres burned, reducing the impacts on forage for livestock use.

Incremental Cumulative Impact – Combined Past, Present, Reasonably Foreseeable Actions – All Alternatives

Incremental cumulative impacts would be similar for all alternatives. Overall, incremental impacts to livestock grazing would vary based on permit requirements, use restrictions, and the size and number of minerals and renewable energy developments and construction associated with ROW and communication site authorizations. Larger facilities would fence off areas to livestock grazing. Management of ACECs and priority wildlife habitat areas would protect forage available to livestock grazing. Incremental impacts would vary by alternative depending on the size and number of ACECs and type of priority habitat areas. Wild horse and burro management would aim to provide forage by attempting to manage for AML. ESR and wildlife habitat improvement treatments would slowly restore forage over time post fire.

4.4.3 Geology and Minerals (Locatable, Salable, and Leasable)

This section is a discussion of the potential impacts of the alternatives on the mineral resources of the CCD. Existing conditions concerning geology and mineral resources are described in **Section 3.3.3, Geology and Minerals**. General management of geologic features would not have an effect on other resources. Areas of unique geological resources are discussed under **Section 4.3.13, Caves and Cave Resources** and **Section 4.5.1, Areas of Critical**

Environmental Concern. Historical mining features, such as abandoned mine lands are discussed in **Section 4.6.2**, Public Health and Safety.

Summary

Mineral resources include fluid and solid minerals leased for development under the Mineral Leasing Act of 1920 and amendments and the Geothermal Steam Act of 1970, the Energy Policy Act of 2005 for geothermal leasing, locatable minerals that may be claimed and patented under the 1872 Mining Law, and common variety materials that may be purchased under the Mineral Material Sales Act of 1947.

Development of the alternatives involved the identification of BLM-administered land that is open or closed, including segregated and withdrawn, to salable, leasable, and locatable mineral activities. On BLM land open to leasing or mineral development, certain areas may be subject to surface use stipulations in addition to those required by regulation or policy or identified on the standard lease or permit form. These additional restrictions could include NSO, CSU, and restrictions based on season or location-specific environmental factors. In many instances, more than one stipulation may apply on the same parcel of land. **Table 2-1** indicates the difference among the alternatives in terms of the level of mineral resource availability and surface use restrictions.

Almost all of the proposed management goals, objectives and actions under each alternative are aimed at protecting other resources and resource uses. In general, these objectives and actions result in varying amounts of use restrictions applicable for each of type of mineral resource category. They also result in varying types and levels of mitigation required for protection of sensitive environmental resources. Other goals, objectives and actions involve frequency and types of audits and inspection of activities related to mineral development to ensure permit compliance and fair compensation for the minerals extracted.

Management for the following resources would not result in an effect on geology and minerals and are therefore not discussed in detail: climate, wild horses and burros, wildland fire ecology and management, paleontological resources, forestry and woodland management, livestock grazing, recreation and visitor services, renewable energy, WSRs, and Back Country Byways.

Methods of Analysis

Methods and Assumptions

This section presents potential impacts on leasable, locatable, and salable mineral (mineral material) resources from management actions for other resource and resource use programs. Mineral resource baseline information in **Section 3.3.3**, Geology and Minerals, was reviewed for current understanding of known resources and to determine the condition of the resources. Also, all laws pertinent to determining effects on mineral resources (e.g., Mineral Leasing

Act of 1920 and amendments; the Energy Policy Act of 2005; the Federal Onshore Oil and Gas Leasing Reform Act of 1987; Geothermal Steam Act of 1970; 1872 Mining Law; Mineral Material Sales Act of 1947) were considered and included in criteria for determining impacts. This known information was overlain with the actions found under each alternative in Chapter 2, and conclusions were drawn based on an understanding of how these types of actions may affect known and potentially discoverable resources.

This analysis includes the following assumptions:

- Existing leases and claims will not be affected by the closures or withdrawals proposed under this RMP.
- Existing leases will be managed under the stipulations in effect.
- All surface-disturbing activities include mitigation measures to reduce impacts on geologic resources. Analysis of impacts assumes that all mitigation measures are in place.
- There will be no major regulatory changes in federal or state statutes, regulations, policy, or guidance that govern exploration and development of minerals.
- Surface-disturbing and other disruptive activities at authorized mining and drilling locations could continue.
- Mineral operations are in compliance with all federal, state, and local government permits.
- Mineral exploration and development will not occur in areas identified as closed or withdrawn from mineral entry.

Indicators

The following indicators were used to assess the degree of impacts on mineral resources:

- The amount of land made unavailable for mineral resource activities
- The restrictions that may be placed on mineral claiming, leasing, or development activities

Withdrawal or closure of an area to mining development removes the mineral resources in that area from being able to be accessed and extracted. This represents an impact on the potential discovery, development, and use of those resources by decreasing the availability of mineral resources. Where information is available, consideration is given to the potential for mineral resources within lands withdrawn or closed. For example, an indicator of a significant impact on mineral resources would be if any of the following were to occur:

- A substantial reduction in federal leasing and development of geothermal resources in high potential areas
- Substantial withdrawals or closures of federal land to development of locatable or salable minerals in areas of high potential

In areas managed as open to mineral development, factors that affect mineral extraction and prospecting include, but are not limited to, permitting, regulatory policy, public perception and concerns, travel management, transportation, proximity to sensitive areas and sensitive noise receptors, low commodity prices, taxes, and housing and other necessities for workers.

Nature and Type of Effects

Salable Minerals

The alternatives would affect salable mineral disposals by various limits on the amount of land available for disposal sites and the areas open with restrictions, as well as limits on operations. The value of most salable minerals is closely tied to the proximity of the source to the final place of use. Closing areas to mineral material disposal would directly impact mineral materials by removing the possibility of mineral resources in that area from being accessed and extracted. If demand for mineral materials could not be met by pits operated on federal lands, pits could be moved onto private or state lands where resources exist. If no mineral materials were to occur near closed areas, developers would have to transport them to construction sites from farther away. This would alter the location of mineral materials development and potentially increase the cost of transportation. Closing land to all forms of disposal would also impair the ability of various levels of government to use nearby materials at no cost for the benefit of public projects. The most common of such projects are the creation or maintenance of rural roads.

Managing areas as ROW avoidance or exclusion would decrease new construction (e.g., roads) and thereby decrease demand for mineral materials in those areas. This, in turn, could decrease the number of mineral material pits on federal mineral estate. In addition, new mineral material pits may not be able to be developed in areas managed as ROW avoidance or exclusion because new roads to these pits could not be constructed in exclusion areas and would be difficult to construct in avoidance areas.

Leasable Minerals

While solid leasable minerals are present within the planning area, no significant production of these minerals is underway or anticipated. Fluid leasable minerals are or may be found in commercially exploitable deposits in the planning area. New technologies, such as hydraulic fracturing, may result in additional oil and gas exploration and eventual production within the planning area; however, there is no data available as the amount of oil and gas potential based on new technology.

The impact issues for fluid minerals result from proposed management objectives and actions to protect other resources. Constraints related to the fluid mineral leasing, exploration, and development include exclusion areas, buffer zones around sensitive areas, seasonal constraints, and conditions of approval. The alternatives would affect fluid mineral development by varying the amounts of land available for leasing and the lease terms and stipulations to be applied on any given tract of land. Closing lands to development would result in reduced domestic production of the US mineral needs and higher dependence on foreign sources of those minerals, reduced economic development on the regional and local levels, loss of royalty, rentals, and pre/post-leasing fee revenues from the lands' minerals, and loss of tax revenue to all levels of government.

Management actions that prohibit or restrict surface occupancy or disturbance overlying federal fluid mineral resources would also directly impact the development of those resources by restricting the availability of mineral resources to be developed or extracted. Examples of these management actions include application of TL, NSO, and CSU stipulations as well as conditionals of approval (COAs). Surface disturbing activities could be shifted, additional protective measures would be required, and extraction delays could occur. All fluid mineral leases are subject to fluid mineral stipulations, but may be granted stipulation waivers, modifications, and exceptions based on site-specific parameters.

In areas where NSO stipulations are applied, federal fluid minerals could be leased; however, the leaseholder/operator would have to use off-site methods, such as directional drilling, to access the mineral resource. The area where directional drilling could be effectively used is limited. This means that some minerals would be inaccessible in areas where an NSO stipulation covers a large area or where no leasing is allowed on surrounding lands. Additionally, because it is not feasible to use directional drilling for wildcat wells, an NSO stipulation would preclude drilling of such wells.

Applying CSU stipulations allows some use and occupancy of the surface. While less restrictive than an NSO stipulation, a CSU stipulation allows the BLM the following actions:

- To require special operational constraints
- To shift the surface-disturbing activity associated with fluid mineral leasing more than the standard 656 feet (200 meters)
- To require additional protective measures to limit impacts on other resources or resource uses.

For example, a CSU stipulation might apply limitations on noise levels during certain times of day. While not prohibiting surface-disturbing activities, a CSU

stipulation can influence the location and level of operations within the subject area.

Areas where TL stipulations are applied would be temporarily closed to fluid mineral exploration and development, surface-disturbing activities, and intensive human activity during identified time frames based on seasons. Some operations would be allowed at all times (e.g., vehicle travel and maintenance); however, construction, drilling, completions, and other operations considered to be intensive would not be allowed during the restricted time frame. Most activities, however, could be initiated and completed outside of the restricted dates specified in the TL stipulation.

Applying COAs to existing leases would directly impact fluid mineral operations. This includes such standards as noise restrictions, height limitations on structures, design requirements, water development standards, and remote monitoring requirements. Additional site-specific planning (i.e., master development plans and unitization) may also be included. Applying these requirements through COAs would impact fluid mineral operations by restricting the development or extraction of mineral resources. To avoid these restrictions, operators may relocate to nearby state or private lands (where resources, geology, and topography permit), thereby decreasing the number of oil, gas, and geothermal operations on federal mineral estate.

Management actions creating ROW exclusion or avoidance areas would indirectly impact fluid mineral extraction by limiting the available means for transporting fluid minerals to processing facilities and markets, for oil and gas, or for transmitting produced geothermal-sourced electricity to the power grid. For example, new geothermal pipelines could not be built in a ROW exclusion area. Oil, gas, and geothermal operations may be moved to nearby private lands where transport and transmission is easier, thereby reducing the number of operations on federal mineral estate. Because ROW avoidance areas would allow for limited ROW development, impacts of avoidance areas would be less severe than those of ROW exclusion areas. Impacts would be mitigated where exceptions were allowed for collocation of new ROWs within existing ROWs to satisfy valid existing rights. Existing leases in areas managed as ROW avoidance or exclusion would also be impacted, as described above.

Closing areas to mineral material disposal would indirectly impact fluid minerals in the areas by reducing the amount of readily available material for road and pipeline construction. This would limit the available means for accessing fluid mineral resources and transporting those resources to processing facilities and markets.

Locatable Minerals

The alternatives would affect locatable mineral exploration and development by varying the amount of federal land under each alternative that is proposed to be withdrawn from mineral entry. Federal land which is withdrawn from mineral

entry would no longer be open to the location of mining claims and would prohibit future mineral exploration and development. Withdrawals are not applied to pre-existing mining claims but would impact future operational proposals (a notice or plan of operations) submitted for exploration or development of locatable minerals on pre-existing mining claims. Closing, segregating, or withdrawing lands to claim and subsequent development would reduce domestic production of our mineral needs and higher dependence on foreign sources of those minerals, reduced economic development on the regional and local levels, and loss of tax revenues to all levels of government that would have resulted from the development of the encompassed minerals.

Withdrawal or closing an area to mining development removes the possibility of mineral resources in that area from being accessed and extracted. This represents an impact on the potential discovery, development, and use of those resources by decreasing the availability of mineral resources on federal mineral estate.

Existing mining claims in areas withdrawn from locatable mineral entry would likely have to undergo a validity exam. If claims were found to be invalid, they could not be developed. These exams would also delay mineral extraction. Finally, operators may choose to relocate outside of the withdrawal area where there are fewer requirements.

A validity exam determines whether a valid existing right exists, which must be recognized even in a withdrawn area. In order to have a valid existing right, a claim holder must demonstrate that, as of the date of the withdrawal, the claim contained a discovery of a valuable mineral deposit and/or that the claim was used and occupied properly under the Mining Law of 1872, as amended.

Existing notices or plans of operations may also have to undergo a validity exam before acceptance (for notice) or approval (for plan of operations) of any material change to the operation. The need to perform validity exams in areas withdrawn from locatable mineral entry would also greatly increase the BLM's burden of processing mining claims, notices, and plans of operations.

Management actions creating ROW exclusion or avoidance areas would indirectly impact locatable mineral extraction by limiting the available means for accessing mineral resources and transporting locatable minerals to processing facilities and markets. For example, new roads to access a mine could not be built in a ROW exclusion area. Locatable mineral operations may be moved to nearby private lands where access is easier, thereby reducing the number of operations on federal mineral estate. Because ROW avoidance areas could allow for limited ROW development, impacts of avoidance areas would be less severe than those of ROW exclusion areas. Impacts would be mitigated where exceptions were allowed for collocation of new ROWs within existing ROWs to satisfy valid existing rights.

Designating areas as special management areas, such as ACECs and WSAs, would trigger the requirement that a plan of operation (including NEPA analysis) would be necessary for any surface-disturbing activities, including exploration related disturbance less than five acres, in those areas in accordance with 43 CFR, 3809 and 3802. The requirement for a plan of operation within a special management area would result in longer delays (typically greater than 6-months) than would be expected if the operation could be acknowledged in 15 days under an exploration notice. Additionally, mitigation measures could be required through the plan of operations approval process and the associated NEPA analysis. This would further restrict locatable mineral exploration and development activities. This would be true even when the surface disturbance proposed is on fewer than 5 acres which is the threshold under which an exploration notice would normally suffice.

Minerals: Effects from Air Quality Management

Effects Common to All Alternatives

Under all alternatives, BLM and BLM-authorized actions on BLM-administered lands would comply with Nevada Revised Statutes 445B.100 through 445B.825 and Nevada Revised Statutes 486A.010 through 486A.180, the State of California's Revised Air Resources Board standards for criteria air pollutants on California Lands, and the Clean Air Act to maintain air quality within the thresholds established by the State of Nevada Air Quality Standards, National Ambient Air Quality Standards, and California's Revised Air Resources Board for California lands.

In addition, BLM and BLM authorized activities would be limited so as not to exceed a 50 percent reduction in ground cover in High Erosion Susceptibility Areas, and OHV use will be limited to designated roads in areas of severe erosion hazard susceptibility.

These statutes, laws and standards include limitations already in effect within the planning area, and no further impacts from Air Quality Management from these implementations are expected to occur.

Effects under Alternative A

Effects under Alternative A would be the same as those described under *Effects Common to All Alternatives*.

Effects under Alternatives B, C, D, and E

Under Alternatives B through E, the regulations and limitations described under *Effects Common to All Alternatives* would be in place with the addition of implementing BMPs and mitigation measures on a case-by-case basis to minimize adverse impacts on air quality. This could include restrictions such as additional dust abatement measures and erosion control measures which may increase the cost of compliance during surface disturbing activities.

Minerals: Effects from Soil Resources

Effects Common to All Alternatives

Under all alternatives, the Navy and the BLM would not allow access to the subsurface by drilling or any other means and/or removal of any subsurface material from the Shoal Site without thorough evaluation and coordination with the Department of Energy

Effects under Alternative A

Management under Alternative A include managing soil resources to reduce soil loss from accelerated wind and water erosion by limiting BLM and BLM-authorized activities so as not to exceed a 50 percent reduction in ground cover in High Erosion Susceptibility Areas. Any proposed activities located on sensitive soils would incorporate BMPs and other mitigation measures to minimize soil erosion and maintain soil stability. This could limit placement of mineral developments and related structures. There would be no additional restrictions to locatable mineral entry, fluid mineral leasing, nonenergy mineral leasing, or mineral material disposal based on management of soil resources under Alternative A.

Effects under Alternative B

Soil resource management under Alternatives B through E would apply CSU stipulations for fluid mineral leasing on lands with slopes greater than 15 percent and less than 50 percent, NSO stipulations on slopes greater than 50 percent, and CSU stipulations on lands with severe wind or water erosion hazard ratings. These stipulations may impact fluid mineral leasing by reducing the area where fluid mineral exploration and development and associated structures could be placed.

There would not be additional restrictions to locatable mining activities or limits on mining operations based on water resource management under Alternative B.

Alternative B would not have any restrictions on nonenergy mineral leasing or mineral material disposable.

Effects under Alternative C

Restriction areas for mineral development from CSU and NSO stipulations resulting from soil management under Alternative C would be the same as those discussed under Alternative B.

Alternative C would also manage priority watersheds to protect related threatened and endangered species habitat as closed to mineral material disposals (except for government use at the Authorized Officer's discretion), closed to nonenergy solid mineral leasing, managed with NSO stipulations for fluid mineral leasing, and managed as ROW exclusion areas, limiting ROWs that could support mineral development. These limitations could restrict where

surface features associated with mineral extraction could be placed which may inhibit mineral production. Locatable mineral entry would not be restricted.

Additional soil resource management under Alternatives C, D, and E would require an erosion control plan for development on slopes between 21 percent and 39 percent. This would need to be approved by the BLM prior to construction and maintenance. Alternatives C, D, and E would prohibit surface disturbing activities on slopes greater than 40 percent, and may allow for placement alternatives if the action would not cause undue or unnecessary degradation on slopes lower than 40 percent, with an erosion control plan in place. These limitations could restrict where surface features associated with mineral extraction could be placed which may inhibit mineral production.

Effects under Alternative D

Restrictions to mineral development from soil management under Alternative D would be the same as those described under Alternative C.

Alternatives D and E would manage priority watersheds containing municipal water supply within a 1,000-foot radius of municipal well heads as closed to mineral material disposal and nonenergy mineral leasing, with NSO stipulations for fluid mineral leasing, and as ROW exclusion areas. The Authorized Officer may consider allowing surface disturbance and/or surface occupancy in priority watersheds on a case-by-case basis. These limitations could restrict where surface features associated with mineral extraction could be placed which may inhibit mineral production. Management of priority watersheds would not restrict locatable mineral entry.

Effects under Alternative E

Restrictions for mineral development from soil management under Alternative E would be the same as those described under Alternative C.

Minerals: Effects from Water Resources

Effects Common to All Alternatives

Mineral activities could be limited under all alternatives to prevent degradation of water quality beyond established standards specified in the Nevada Water Pollution Control statutes and the September 2004 memorandum of understanding between the BLM and the State of Nevada. In addition, satisfactory watershed conditions would be maintained as indicated by maintenance of riparian proper functioning conditions, Standards for Rangeland Health and Guidelines for Grazing Management (BLM version 2, 2012), and Guidelines for Grazing and Standards for Public Health and Guidelines for Recreation Management for BLM-administered lands.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Minerals: Effects from Vegetation Resources

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

There are no closures or stipulations proposed for mineral resources from vegetation management under Alternative A.

Effects under Alternative B

Riparian Areas

Alternative B would recommend, to the extent possible, pipeline crossings of streams should be constructed to withstand 100-year floods, which may affect the location of pipeline crossings and increase the cost of pipelines associated with mineral development. This would be applicable to any discretionary mineral development requiring pipelines.

Vegetation: Invasive, Nonnative Species, and Noxious Weeds

Alternatives B through E would minimize the spread of noxious weeds through the control of materials contaminated with noxious seeds or plant parts by requiring salable mineral materials obtained from BLM-administered land to have Weed Free certification from the Nevada Department of Agriculture. Existing operation would be encouraged to obtain a Weed Free certification. Construction for all discretionary minerals actions would require the use of certified weed free construction materials.

Additionally, discretionary construction activities on BLM-administered land would be required to utilize earth materials certified as Weed Free by the State of Nevada and State of California. Also, new, periodic review of, and amendment request for land use authorizations would require an additional stipulation in the authorization addressing noxious weed management. Acquisition of Weed Free materials may increase the cost of mineral extraction and construction of associated features. Acquisition of Weed Free materials would potentially improve reclamation revegetation success and reduce costs to

control invasive or noxious weeds within reclaimed areas and may provide future seed stock, which would lower future costs.

Effects under Alternative C

Riparian Areas

Under Alternative C riparian and wetland area management would preclude surface disturbing activities within 100-year floodplains, within 200 feet of riparian areas, and within 500 feet of springs which could affect the location of all discretionary mineral development actions. Riparian and wetland areas would be closed to mineral material disposal within 200 feet. NSO stipulations for fluid mineral leasing would be applied within 500 feet of riparian and wetland areas and playas, and within 100 year floodplains. Adjustments may be made to these buffers based upon the resource values associated with riparian/wetland areas and the scope of surface disturbing activities.

Alternative C would require that pipelines crossing stream channels would be constructed to withstand 100-year floods in order to prevent breakage and subsequent accidental contamination of runoff during high-flow events. This would be applicable to any discretionary mineral development actions requiring pipelines.

Invasive, Nonnative Species and Noxious Weeds

Additional management actions implemented for noxious weed management would have the same impacts on mineral resources under Alternative C as those described under Alternative B.

Effects under Alternative D

Vegetation: Riparian Areas

Riparian management under Alternative C would preclude surface disturbing activities within 200 feet of riparian areas and within 500 feet of springs which would affect all discretionary mineral development actions, and would apply a CSU stipulation for fluid mineral leasing within 200 feet of riparian and wetland areas, 100-year floodplains and on or within 500 feet of playas. Riparian areas would also be managed as ROW avoidance areas, which could limit ROWs needed to provide infrastructure to support mineral development. Adjustments may be made to these buffers based upon the resource values associated with riparian/wetland areas and the scope of any surface disturbing activities.

Alternative D would recommend that, to the extent possible, pipeline crossings of streams would be constructed to withstand 100-year floods, which may increase the cost of pipelines. In addition, pipeline construction would need to take ecological goals into account, and aim to reduce habitat fragmentation.

Invasive, Nonnative Species and Noxious Weeds

Additional management actions implemented for noxious weed management would have the same impacts on mineral resources under Alternative D as those described under Alternative B.

Effects under Alternative E

Riparian Areas

Riparian management under Alternative E would be similar to those described under Alternative D. In addition, NSO stipulations would be applied for fluid mineral leasing within 500 feet of riparian and wetland areas, 100-year floodplains, and on or within 500 feet of playas. Adjustments may be made to these buffers based upon the resource values associated with riparian/wetland areas and the scope of surface disturbing activities, including any mineral development.

As with Alternative D, Alternative E would recommend that, to the extent possible, pipeline crossings of streams should be constructed to withstand 100-year floods, which may increase the cost of pipelines. In addition, pipeline construction would need to take ecological goals into account, and aim to reduce habitat fragmentation.

Invasive, Nonnative Species and Noxious Weeds

Additional management actions implemented for noxious weed management would have the same impacts on mineral resources under Alternative E as those described under Alternative B.

Minerals: Effects from Fish and Wildlife Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Management objectives for fish and wildlife under Alternative A would not provide for any land use restrictions that would limit the location of mineral exploration and development beyond those specified in existing leases and permits and plan of operations.

Effects under Alternative B

Wildlife Habitat

Alternative B would implement CSU stipulations for fluid mineral leasing within 500 feet of lentic and lotic habitats and 100-foot ROW avoidance buffer around fish and wildlife priority habitat. This would limit mineral production in these areas. Alternative B would limit mineral production more than Alternative A due to additional restrictions being implemented. Wildlife habitat management

would not restrict mineral development of mineral material disposal, nonenergy leasable, or locatable mineral exploration and development.

Migratory Birds

Alternative B would manage Important Bird Areas as ROW avoidance areas and implement CSU stipulations for fluid mineral leasing.

Raptors

Alternative B would implement CSU stipulations for fluid mineral leasing within 0.25 miles of active nest sites and would manage active nest sites as ROW avoidance areas. Raptor habitat management would not affect the other mineral developments.

Effects under Alternative C

Wildlife Habitat

Alternative C would implement NSO stipulations for fluid mineral leasing within 500 feet of lentic and lotic habitats with no exceptions, modifications, or waivers. Additionally, Alternative C would manage fish and wildlife habitat as ROW exclusion areas with a 500-foot buffer and would close these areas to mineral material disposal and nonenergy mineral leasing. Alternative C would place more restrictions on mineral production within wildlife habitat than Alternative A due to additional stipulations and closures.

Migratory Birds

Alternative C would manage Important Bird Areas as ROW exclusion areas with NSO stipulations for fluid mineral leasing, and as closed to mineral material disposal. This would not affect locatable mineral entry or nonenergy mineral leasing. The BLM would place more restrictions on mineral development under Alternative C than under other alternatives through closures and surface management.

Bat Habitat

Alternative C would prohibit large-scale surface-disturbing discretionary actions within 500 feet of occupied bat caves that would apply to any surface disturbing activities.

Raptors

Alternative C would include NSO stipulations for fluid mineral leasing within 0.5 miles of active nest sites, with closure to mineral material disposal and nonenergy leasing. Alternative C would also manage nest sites as ROW exclusion areas. Alternative C would place more restrictions on mineral development than Alternative A.

Effects under Alternative D

Wildlife Habitat

Wildlife habitat management under Alternative D would be the same as those described under Alternative B.

Migratory Birds

Important Bird Area management under Alternative D would be the same as described under Alternative B.

Bat Habitat

Alternative D would prohibit large-scale surface-disturbing discretionary actions within 200 feet of bat occupied caves, which is the least restrictive buffer around caves of Alternatives that would implement them.

Raptors

Under Alternative D raptor habitat management would be the same as those described under Alternative B.

Effects under Alternative E

Wildlife Habitat

Wildlife habitat management under Alternative E would apply NSO stipulations within 500 feet of lentic and lotic habitat with some exceptions, modifications, and waivers, and would manage fish and wildlife priority habitat is ROW avoidance areas with a 100-foot buffer. This would be more restrictive than Alternative A.

Migratory Birds

Important Bird Area management under Alternative E would be the same as described under Alternative B.

Bat Habitat

Alternative E would prohibit large-scale surface-disturbing discretionary actions within 0.5 miles of bat occupied caves and within 0.25 miles of caves not known to be occupied by bats. This could affect the placement of mineral exploration and development features more than Alternative A due to the buffer where surface-disturbing activities would be prohibited.

Raptors

Raptor habitat management under Alternative E would be the same as described under Alternative C.

Minerals: Effects from Special Status Species Management

Under all alternatives, surveys for sensitive species in the project area would be required before any leasing or surface disturbance would be authorized. At the leasing stage, only a literature or existing data search is required. Discretionary mineral activities could be restricted or additional mitigations could be required if

it were determined that they affect federally listed species or habitat. For locatable minerals designating ACECs to protect sensitive species would require a plan of operations for proposals within ACEC boundaries or mineral entry may be withdrawn based on the range of alternatives. Designation ACECs would restrict fluid minerals, salable and solid minerals operations or may close areas to development to varying degrees based on the number of ACECs proposed.

Locatable mineral rights could be acquired or protective mineral withdrawals pursued within sage-grouse leks, but proposals for discretionary mineral operations would include the following requirements (with some exceptions, modifications, and waivers authorized by the BLM):

- Protect sage-grouse habitat by implementing use restrictions, stipulations, and mitigation measures incorporating protection of un-fragmented habitats, minimization of habitat loss, maintenance, and enhance or restore habitat conditions.
- On a case-by-case basis, apply no surface disturbance or NSO stipulations when locating high profile structures (e.g., buildings, storage tanks, overhead power lines) near active sage-grouse leks.

Discretionary mineral actions would be subject to required mitigation measures to include avoidance, NSO stipulations, buffer zones, seasonal restrictions, off site mitigation, use restrictions and rehabilitation to protect sensitive species habitat. The restrictions would result in less land available for mineral exploration and development activities.

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Management of special status species under Alternative A would not provide for any land use restrictions that would limit the location of mineral exploration and development.

Effects under Alternative B

Greater Sage-Grouse

Greater Sage-Grouse habitat management would manage PPMA (275,600 acres) with CSU stipulations for fluid mineral leasing, which may include restriction on construction during certain hours of the day. Additionally, the BLM would manage PPMA as ROW avoidance. The BLM would place more restrictions on mineral development under Alternative B than Alternative A.

Alternative B would also apply timing limitation stipulations to fluid mineral leasing within 0.6-mile of springs, meadows, and riparian corridors (late brood-rearing habitat) within PPMA and PGMA from May 15 to August 15 (dates can

be extended to September 15 for the Bi-State distinct population segment). During this timeframe, surface use would be prohibited. This stipulation does not apply to operations and maintenance of production facilities. Alternative B would be the only alternative to implement timing limitation for fluid mineral leasing in these areas. Additionally, fluid mineral related surface disturbing activities would be restricted within 0.6 miles of active Greater Sage-Grouse nests from approximately April 1 through June 30.

Effects under Alternative C

Greater Sage-Grouse

Alternative C would close PPMA and PGMA (414,200 acres) to fluid mineral leasing, nonenergy mineral leasing, and mineral material disposal. In addition, the BLM would manage these areas as ROW exclusion areas. The BLM would place the most restrictions on mineral development of all the alternatives.

Under Alternatives C, D, and E, surface disturbing activities would be prohibited within 4 miles of active Greater Sage-Grouse nests from approximately April 1 through June 30. This would place more restrictions on discretionary mineral development activities than Alternative A.

Effects under Alternative D

Greater Sage-Grouse

Under Alternatives D and E, Greater Sage-Grouse habitat management would apply NSO stipulations for fluid mineral leasing within PPMA (275,600 acres) with no exceptions, modifications, or waivers. Alternative D would apply NSO stipulations for fluid mineral leasing within PGMA (138,600 acres) with exceptions, modifications, and waivers as outlined in **Appendix C**, and would manage PPMA and PGMA as ROW avoidance areas (414,200 acres).

Effects under Alternative E

Greater Sage-Grouse

Greater Sage-Grouse habitat management under Alternative E would be similar to those described under Alternative D. In addition to the management actions under Alternative D, Alternative E would close PPMA and PGMA to nonenergy mineral leasing and mineral material disposal.

Minerals: Effects from Cultural Resources Management

Effects Common to All Alternatives

Under all alternatives, in compliance with Section 106 of NHPA, surveys for cultural resources in the project area would be required before any surface disturbance would be authorized. Minerals activities could be restricted or additional mitigations required if it were determined that they affect cultural

sites listed on the NRHP or that have been determined to be eligible for that listing.

The rights to locatable minerals could be acquired, but proposals for locatable mineral operations within 0.25 mile of cultural sites listed on the NRHP or that have been determined to be eligible for listing may be restricted or require mitigation measures to protect cultural resources.

Effects under Alternative A

In addition to the management actions described under *Effects Common to All Alternatives*, the BLM would pursue the withdrawal of locatable minerals from the Grimes Point Archaeological District, the Sand Mountain Recreation Area, and the Cold Springs Historical Site. This would prohibit locatable mineral development in these areas.

Effects under Alternative B

Cultural resource management under Alternative B would implement more management actions that would restrict mineral development than Alternative A. However, due to Alternative A seeking the withdrawal of locatable mineral entry from various locations, Alternative B would be less restrictive of mineral development. Cultural and historic rock art sites would be protected by a 0.125-mile buffer in which surface disturbing activities and visual intrusions that adversely affect these features would be prohibited. This may offset the placement of any mineral production and associated features near these areas.

The BLM would manage NRHP-listed Properties and Districts, National Historical Landmarks, and Traditional Cultural Properties currently listed, eligible, or known but not yet formally designated for the NRHP as ROW-avoidance areas and would place CSU stipulations on fluid mineral leasing.

Alternatives B through E would follow the guidance of the Native American Graves Protection and Repatriation Act during all mineral development. Alternative B would close areas known to contain human burials to surface disturbing activities when feasible, and appropriate federal, state, and local laws would be followed when disturbance is necessary.

Effects under Alternative C

Cultural and historic rock art sites would be protected by a 1-mile buffer in which discretionary surface disturbing activities and visual intrusions that adversely affect these features would be prohibited.

The BLM would manage NRHP-listed Properties and Districts, National Historical Landmarks, and Traditional Cultural Properties currently listed, eligible, or known but not yet formally designated for the NRHP as ROW-avoidance areas, would place CSU stipulations applied on fluid mineral leasing, and would close these areas to mineral material disposal.

Under Alternative C, protection of human burials would be similar as those described under Alternative B.

Effects under Alternative D

Cultural and historic rock art sites would be protected by a 0.125-mile buffer in which surface disturbing activities and visual intrusions that adversely affect these features would be prohibited. This would be the same as Alternative B.

The BLM would manage NRHP-listed Properties and Districts, National Historical Landmarks, and Traditional Cultural listed, eligible, or known and not yet formally designated for the NRHP the same as under Alternative B.

Under Alternative D, protection of human burials would be similar as those described under Alternative B.

Effects under Alternative E

Cultural and historic rock art sites would be protected by a 0.5-mile buffer or the visual horizon in which discretionary surface disturbing activities and visual intrusions that adversely affect these features would be prohibited.

The BLM would manage NRHP-listed Properties and Districts, National Historical Landmarks, and Traditional Cultural Properties listed, eligible, or known and not yet formally designated for the NRHP as ROW-avoidance areas and would apply NSO stipulation on fluid mineral leasing.

Alternative E would prohibit BLM-Authorized activities within the Virginia City National Historic Landmark District and would close the area to nonenergy mineral leasing. Alternative E would also implement a NSO stipulation for fluid mineral leasing and would manage the district as a ROW avoidance area. This is the only alternative that would apply these land use restriction to the Virginia City National Historic Landmark under cultural resources management. Alternatives B, C, and D would manage this area as an ACEC, and Alternative A would not implement additional management actions.

Alternative E would also designate 15,900 acres as the Wyemaha Archaeological District to protect cultural resources, encompassing the Grimes Point Archaeological District ACEC. Associated land use restrictions that would apply include recommendation for withdrawal from locatable mineral entry, closure to fluid mineral leasing, and management as an ROW avoidance area. Alternative E would be the only Alternative that would designate the Wyemaha Archaeological District.

Alternative E would prohibit BLM-authorized activities within the Pistone site (3,100 acres) if they adversely affect local rock art resources. Additionally, Alternative E would manage the Pistone site as a ROW avoidance area, with closure to mineral material disposal and fluid mineral leasing, and a recommendation for withdrawal from locatable mineral entry.

Minerals: Effects from Visual Resources Management

Effects Common to All Alternatives

All of the alternatives would require identification and management of areas according to their VRM values. Activities not meeting the VRM objectives may require mitigations, as determined on a case-by-case basis. Surface use stipulations under some VRM classes could redesign, cancel, or mitigate mineral activities. In addition, the alternatives require the protection of the visual integrity of the National Historic Trails and their viewsheds.

Management of visual resources would not limit exploration or development of mineral resources, but may impose restriction on location of associated features and require mitigation based on color, line, contrast, and visual setting as required by the VRM classification. With respect to effects on minerals resources, all of the alternatives are essentially equivalent.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Minerals: Effects from Caves and Cave Resources Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

There would be no restrictions on ROW development or surface use for mining activities or limits on mining operations based on cave resources characteristics management objectives or actions under Alternative A.

Effects under Alternative B

Alternative B would restrict discretionary mineral development activities around Dynamite Cave by implementing a 0.25-mile ROW avoidance area around the cave, closing the area to mineral material disposal, and applying a 500-foot CSU stipulation for fluid mineral leasing. Nonenergy mineral leasing, locatable mineral entry, and mineral material disposal would not be affected.

Alternative B would restrict mineral development around Hidden Cave by implementing a ROW avoidance area within 500 feet of the cave, managing closure of the area to mineral material disposal, and applying CSU stipulations within 500 feet of the cave for fluid mineral leasing. Nonenergy mineral leasing, locatable mineral entry, and mineral material disposal would not be affected.

Effects under Alternative C

Management under Alternative C would restrict mineral development around Dynamite Cave by implementing a 0.5-mile ROW exclusion area around the cave, closing the area to mineral material disposal and fluid mineral leasing, recommending the area for withdrawal from locatable mineral entry, and managing closure of the area to motorized travel within 500 feet of the cave.

Alternative C would restrict mineral development around Hidden Cave by managing as a ROW exclusion area within 500 feet of the cave, closing the area to fluid mineral leasing and mineral material disposal, recommending the area for withdraw from locatable mineral entry, and managing closing the area to motorized travel within 500 feet of the cave.

Effects under Alternative D

Specific management of Hidden Cave and Dynamite Cave under Alternative D would have the same effects on mineral resources as Alternative B. These measures would be more restrictive of mineral resources associated with caves than Alternative A.

Effects under Alternative E

Alternative E would restrict mineral development around Hidden Cave by implementing a ROW exclusion area within 500 feet of the cave, closing the area to fluid mineral leasing and mineral material disposal, recommending the area for withdraw from locatable mineral entry, and closing the area to motorized travel within 500 feet of the cave.

Management of Dynamite Cave under Alternative E would be the same as management of the cave under Alternative C.

Management of caves and cave resources would result in more restrictions on mineral resource development under Alternative E than under Alternative A.

Minerals: Effects from Geology and Mineral Management

Effects Common to All Alternatives

Impacts from mineral exploration are likely to include surface disturbances related to the construction of exploration drill roads and drilling pads. New and existing large-scale mines, mine expansions, and small-scale mining operations are likely to involve access road construction, increased traffic and surface disturbances associated with various mine facilities (for example: portals, pits, waste rock dumps, ore processing, tailing facilities, heap leach pads,

administration and maintenance facilities; and storm water runoff control ponds and diversions structures).

Impacts on mining include increased operational limits and costs associated with reclamation and interim reclamation. All alternatives include provisions for implementing concurrent reclamation at all mineral operations and interim reclamation for all facilities or features that would be unused for more than one year. These provisions will reduce the amount of land disturbed at any one time, as well as reducing erosion, loss of growth media, and siltation of nearby waterways. In addition, there would be no reduction of existing public access to BLM-administered lands due to occupancy associated with minerals activities.

The Programmatic EIS for Geothermal Leasing in the western United States (BLM and Forest Service 2008), issued in December 2008, include provisions on lands open or closed to geothermal leasing and standardized stipulations, restrictions, and mitigations for geothermal exploration, development, and production. These conditions and restrictions will apply to the lands within the planning area except where this RMP EIS determines different or additional conditions or stipulations apply to specific locations.

Effects under Alternative A

Under Alternative A, the BLM would manage 56,900 acres as closed to all mineral entry, exploration, and development, and energy development under the Classification and Multiple Use Act, the Walker Planning Area, the Carson City Urban Interface Plan, and under existing withdrawals and segregation from mineral entry that would be maintained.

Locatable Minerals

Alternative A would maintain withdrawal of 194,900 acres of federal mineral estate from locatable mineral entry. Alternative A would also replace pre-FLPMA Classification and Multiple Use Act segregations with FLPMA withdrawals which would result in withdrawing 3,700 acres of currently segregated lands from locatable mineral entry.

Fluid Minerals

Alternative A would continue to manage 839,100 acres as closed to oil and gas and geothermal leasing. The BLM would apply NSO stipulations for oil and gas leasing on an additional 700 acres with, including areas within 300 to 500 feet of water resources, and around important archaeological sites. The BLM would manage a total of 839,800 acres with restrictions for fluid mineral leasing. This would be the fewest acres of closure and surface restriction for fluid minerals of the alternatives.

Mineral Materials (Salable)

Alternative A would manage 564,200 acres as closed to mineral material disposal.

Nonenergy Leasable Minerals:

Alternative A would close 738,800 acres to nonenergy leasable minerals.

Effects under Alternative B

Locatable Minerals

Alternative B would recommend 439,600 acres for withdrawal from locatable mineral entry.

Fluid Minerals

Alternative B would manage 768,500 acres as closed to oil and gas and geothermal leasing. An additional 404,600 acres located within ACECs and areas with slopes greater than 50 percent would be managed with NSO stipulations for fluid mineral leasing. The BLM would apply CSU stipulations on 2,120,200 acres, including PPMA, some ACECs, NRHP-listed properties, within 500 feet of Dynamite and Hidden Caves or lentic and lotic habitats, additional lands with slopes greater than 50 percent, lands with severe soil, wind, or water erosion, within Important Bird Areas, and within 0.25 mile of raptor nests. Additionally, the BLM would apply timing limitations within 0.6 miles of springs, meadows, and riparian corridors within PPMA and PGMA from May 15 through August 15.

This is a total of 3,293,300 acres of restrictions for fluid minerals, which is more than Alternative A.

Mineral Materials (Salable)

Alternative B would manage 807,200 acres as closed to mineral material disposal, including Hidden and Dynamite Caves, WSAs, and within 300 feet of known human burials. Alternative B would restrict mineral material disposal within PPMA and PGMA if it is determined that there would be adverse impacts on Greater Sage-Grouse or their habitat. This could result in restrictions for mineral material development on an additional 414,200 acres (PPMA and PGMA)

Assuming that PPMA and PGMA remain open or that mineral material disposal could be mitigated to not adversely affect Greater Sage-Grouse habitat, Alternative B would manage the more acres with restrictions on mineral materials than Alternative A.

Nonenergy Leasable Minerals:

Alternative B would manage 981,900 acres would be closed to nonenergy leasable minerals, including WSAs, areas within 300 feet of known human burials, and Washoe County. Alternative B would restrict nonenergy leasable mineral development within PPMA and PGMA if it is determined that there would be adverse impacts on Greater Sage-Grouse or their habitat.

Assuming that PPMA and PGMA remain open or that nonenergy leasable mineral development could be mitigated to not adversely affect Greater Sage-

Grouse habitat, Alternative B would restrict more acres of closure to nonenergy leasable minerals than Alternative A.

Effects under Alternative C

Locatable Minerals

Under Alternative C, 117,500 acres would be recommended for withdrawal from locatable mineral entry, which is greater than all other Alternatives.

Fluid Minerals

Alternative C would manage 2,081,700 acres as closed to oil and gas and geothermal leasing. The BLM would apply NSO stipulations for fluid mineral leasing on 1,039,200 acres, including areas within 0.5 miles of active raptor nests. Areas managed as closed would include lands with slopes greater than 50 percent, priority watersheds containing municipal water supplies, areas within 500 feet of riparian/wetland areas and lentic and lotic habitats, Important Bird Areas, NRHP-listed properties, ACECs, the East Fork Carson River Segment I, and BCWCAs and National Historical Trails. The BLM would apply CSU stipulations on an additional 1,242,800 acres, including lands with slopes greater than 15 percent and less than 50 percent, and lands with severe soil, wind or water erosion hazard ratings. Additionally, the BLM would implement timing limitations for big game fawning, calving, and kidding areas and big game winter ranges as discussed under Fish and Wildlife, and within 0.6 miles of springs, meadows, and riparian corridors within PGMA from May 15 to August 15.

This is a total of 4,363,700 acres of restrictions for fluid mineral leasing, which is nearly the entire planning area.

Mineral Materials (Salable)

The BLM would manage 3,004,800 acres as closed to mineral material disposal. This includes caves and cave resources, priority watersheds containing municipal water supplies, within 200 feet of riparian/wetland areas, fish and wildlife priority habitats, within 0.5 mile of active raptor nests, PPMA and PGMA, some ACECs, within 2.5 miles of NHT corridors, the East Fork Carson River Segment, within 1 mile of known human burials, the Virginia Range ERMA and BCWCAs.

Alternative C would close more acres to mineral materials than any of the other Alternatives.

Nonenergy Leasable Minerals:

Alternative C would close 2,960,800 acres to nonenergy mineral leasing, including priority watersheds containing municipal water supplies, fish and wildlife priority habitats, areas within 0.5 mile of active raptor nests, PPMA and PGMA, some ACECs, within 2.5 miles of NHT corridors, WSAs, within 0.25 mile of the East Fork Carson River Segment I (0.25 mile), within 1 mile of known human burials, Washoe County, and BCWCAs.

Alternative C would manage more acres as closed to nonenergy leasable minerals than any of the other alternatives.

Effects under Alternative D

Locatable Minerals

Under Alternative D 470,600 acres would be recommended for withdrawal from locatable mineral entry, which is more than any of the other alternatives.

Fluid Minerals

Alternative D would manage 737,000 acres as closed to oil and gas and geothermal leasing. The BLM would apply NSO stipulations for fluid mineral leasing on 864,800 acres. This includes the Pah Rah ACEC, lands with slopes greater than 50 percent, within 1,000 feet of municipal well heads in priority watersheds, PPMA and PGMA, the WSR East Fork Carson River Segment I. Also, CSU stipulations would be applied to 2,071,400 acres including areas within 200 feet of riparian/wetland areas, within 500 feet of lentic and lotic habitat, lands with slopes greater than 15 percent and less than 50 percent, lands with severe soil, wind or water erosion hazard ratings, Important Bird Areas, NRHP-Listed properties, and some ACECs.

This is a total of 3,673,200 acres of restrictions for fluid mineral leasing, which is more than Alternative A but less than the other alternatives.

Mineral Materials (Salable)

Alternative D would manage 807,700 acres as closed to mineral material sales, including caves and cave resources, within 1,000 feet of municipal well heads in priority watersheds, some ACECs, WSAs, the East Fork Carson River Segment I, and within 0.25 mile of known human burials. Alternative D would restrict nonenergy mineral material disposal within Grater Sage-Grouse PPMA and PGMA if it is determined that there would be adverse impacts on Greater-Sage Grouse or their habitat. This could result in restrictions for mineral material development on 414,200 acres.

Assuming that PPMA and PGMA remain open or that mineral material disposal could be mitigated to not adversely affect Greater Sage-Grouse habitat, Alternative D would manage more acres as closed to mineral material sales than Alternative A.

Nonenergy Leasable Minerals:

Alternative D would close 1,785,900 acres to nonenergy leasable minerals, including areas within 1,000 feet of municipal wellheads, the Virginia Range Combleaf Botanical ACEC, WSAs, within 0.25 mile of the East Fork Carson River Segment, within 300 feet of known human burial, and Washoe County.

Alternative D would restrict nonenergy leasable mineral development within PPMA and PGMA if it is determined that there would be adverse impacts on Greater Sage-Grouse or their habitat.

Assuming that PPMA and PGMA remain open or that mineral material disposal could be mitigated to not adversely affect Greater Sage-Grouse habitat, Alternative D would manage more acres as closed to mineral material sales than all of the alternatives, except for Alternative C.

Effects under Alternative E

Locatable Minerals

Alternative E would recommend 470,66 acres for withdrawal from locatable mineral entry, which is the greatest of all alternatives.

Fluid Minerals

Alternative E would manage 1,007,200 acres as closed to oil and gas and geothermal leasing. The BLM would apply NSO stipulations on 1,151,600 acres, including lands with slopes greater than 50 percent, within 1,000 feet of municipal well heads in priority watersheds, areas within 500 feet of riparian/wetland areas and lentic and lotic habitats, within 0.5 mile of raptor nests, within Greater-Sage Grouse PPMA and PGMA, NRHP-listed properties, and the WSR East Fork Carson River Segment I. Alternative E would manage 1,844,900 acres with CSU stipulations, including lands with slopes greater than 15 percent and less than 50 percent, lands with severe soil, wind or water erosion hazard ratings, and Important Bird Areas. Additionally, the BLM would implement timing limitations for big game fawning, calving, and kidding areas and big game winter ranges as discussed under Fish and Wildlife, and within 0.6 miles of springs, meadows, and riparian corridors within PGMA from May 15 to August 15.

This is a total of 4,003,700 acres of restrictions for fluid mineral leasing, which is more than all of the alternatives, except for Alternative C.

Mineral Materials (Salable)

Alternative E would manage 1,778,700 acres as closed to mineral material disposal, including caves and cave resources, within 1,000 feet of municipal wellheads in priority watersheds, fish and wildlife priority habitat areas, within 0.5 mile of active raptor nests, within Greater Sage-Grouse PPMA and PGMA, the Ruhenstroth Paleontological ACEC, within 1 mile of high potential historic sites and high potential route segments along NHT corridors, WSAs, the East Fork Carson River Segment I, within 300 feet of known human burials, and the Virginia Range ERMA.

Alternative E would close more acreage to mineral materials than all of the alternatives, except for Alternative C.

Nonenergy Leasable Minerals:

Alternative E would manage 1,785,900 acres as closed to nonenergy leasable minerals, including areas within 1,000 feet municipal wellheads, within 0.5 mile of active raptor nests, the Sand mountain SRMA, the Ruhenstroth Paleontological ACEC, within 1 mile of high potential historic sites and high potential route segments along NHT corridors, WSAs, within 0.25 mile of the East Fork Carson River Segment, and within 300 feet of known human burial, and Washoe County.

Alternative E would close more acres to nonenergy leasable minerals than all of the alternatives, except for Alternative C.

Minerals: Effects from Comprehensive Travel and Transportation Management

Effects Common to All Alternatives

Avoiding duplication of roads and allowing continued public access on existing roads may result in greater levels of traffic on system roads. Under all alternatives, the primary users of system roads may be held responsible for funding or implementing road upkeep, especially where the mining-related traffic has higher level road design requirements than the BLM's.

Areas closed to OHV use may require some stipulations and/or restrictions determined on a case-by-case basis through project specific NEPA analysis. Areas closed to OHV use would be open to acquiring rights for locatable minerals, but locatable proposals for mineral operations in these areas would require special handling (submission of a plan of operation under present 3809 regulations) or have additional limitations or stipulations applied to authorizations.

Other than the conditions discussed above, there would be no restrictions under any of the alternatives to mining or limits on mining, based on transportation and access management objectives or actions.

Effects under Alternative A

Alternative A would manage 3,840,300 acres as open to cross-country travel, 6,900 acres as closed to motorized and mechanized travel, 31,800 acres as closed to motorized travel with mechanized travel limited to existing routes, and 924,300 acres as limited to existing roads for motorized travel for a total of 963,000 acres of restrictions.

Effects under Alternative B

Alternative B would manage 95,300 acres as open to cross-country travel, 4,300 acres as closed to motorized and mechanized travel, and 26,700 acres as closed to motorized travel with mechanized travel limited to existing routes, and 4,677,000 acres as limited to existing roads for motorized travel, for a total of 4,708,000 acres of restriction.

Alternative B would manage fewer acres closed to motorized and mechanized travel than Alternative A. Alternative B would manage fewer acres as closed to motorized travel, with mechanized travel limited to existing routes than Alternative A. Alternative B would manage more acres as limited to existing routes for motorized and mechanized travel than Alternative A. Overall, Alternative B would manage more acres with restrictions than Alternative A.

Effects under Alternative C

Alternative C would manage 1,300 acres as open to cross-country travel, 1,190,500 acres as closed to motorized and mechanized travel, 598,000 acres as closed to motorized travel with mechanized travel limited to existing routes, and 3,013,500 acres as limited to existing roads for motorized travel, for a total of 4,802,000 acres of restriction.

Alternative C would manage the most acres as closed to motorized and mechanized travel of all the alternatives. Alternative C would manage the most acres as closed to motorized travel with mechanized travel limited to existing routes. Alternative C would manage more acres as limited to existing routes for motorized and mechanized travel than Alternative A.

Effects under Alternative D

Alternative D would manage 22,700 acres as open to cross-country travel, 1,600 acres as closed to motorized and mechanized travel, 30,600 acres as closed to motorized travel with mechanized travel limited to existing routes, and 4,748,400 acres as limited to existing roads for motorized travel, for a total of 4,780,600 acres of restriction.

Alternative D would manage fewer acres closed to motorized and mechanized travel than Alternative A. Alternative D would manage the fewest acres as closed to motorized travel, with mechanized travel limited to existing routes of all the alternatives, and more acres as limited to existing routes for motorized and mechanized travel than all the alternatives. Overall, Alternative D would manage more acres with restrictions than Alternative A.

Effects under Alternative E

Alternative E would manage 55,700 acres as open to cross-country travel, 6,200 acres as closed to motorized and mechanized travel, 24,100 acres as closed to motorized travel with mechanized travel limited to existing routes, and 4,717,300 acres as limited to existing roads for motorized travel, for a total of 4,747,600 acres of restriction.

Alternative E would manage the fewest acres closed to motorized and mechanized travel of all the alternatives. Alternative E would manage fewer acres as closed to motorized travel, with mechanized travel limited to existing routes than Alternative A. Alternative E would manage more acres as limited to existing routes for motorized and mechanized travel than Alternative A. Alternative E would manage more acres with restrictions than Alternative A.

Minerals: Effects from Lands and Realty

Effects Common to All Alternatives

Mineral Materials

Managing areas as ROW avoidance or exclusion would decrease new construction (e.g., roads) and thereby decrease demand for mineral materials in those areas. This, in turn, could decrease the number of mineral material pits on federal mineral estate. In addition, new mineral material pits may not be able to be developed in areas managed as ROW avoidance or exclusion because new roads to these pits could not be constructed in exclusion areas and would be difficult to construct in avoidance areas.

Fluid Minerals

Management actions creating ROW exclusion or avoidance areas would indirectly impact leasable mineral extraction by limiting the available means for accessing mineral resources and transporting minerals to processing facilities and markets, and would indirectly impact fluid mineral extraction by limiting the available means for transporting fluid minerals to processing facilities and markets, for oil and gas, or for transmitting produced geothermal-sourced electricity to the power grid. For example, new geothermal pipelines could not be built in a ROW exclusion area. Oil, gas, and geothermal operations may be moved to nearby private lands where transport and transmission is easier, thereby reducing the number of operations on federal mineral estate. Because ROW avoidance areas would allow for limited ROW development, impacts of avoidance areas would be less severe than those of ROW exclusion areas. Impacts would be mitigated where exceptions were allowed for collocation of new ROWs within existing ROWs to satisfy valid existing rights. Existing leases in areas managed as ROW avoidance or exclusion would also be impacted, as described above.

Locatable Minerals

Management actions creating ROW exclusion or avoidance areas would not have a substantial effect on non-discretionary locatable minerals activities as most appurtenant rights-of-way are acknowledged or authorized under notices and plans of operation, respectively. However if ROWs are needed to supporting locatable mining operations, ROWs may not be available or special stipulations may be added that would affect ROW facility locations and costs. Locatable minerals operations would mitigate impacts to prevent unnecessary or undue degradation as necessary within ROW exclusion/avoidance areas. For example, impacts would be mitigated through collocation of new ROWs within existing ROWs.

Effects under Alternative A

Alternative A would manage 564,100 acres as ROW exclusion, and would not manage any acres as ROW avoidance. Land Use Authorizations and

management under Alternative A would restrict the least amount of land for ROW entry and development of all the alternatives.

Effects under Alternative B

Alternative B would manage 580,000 acres as ROW exclusion and 1,039,200 acres as ROW avoidance, totaling 1,195,800 acres of ROW entry restriction. This is more than Alternative A.

Effects under Alternative C

Alternative C would manage 2,675,800 acres as ROW exclusion and 369,300 acres as ROW avoidance, totaling 3,045,100 acres of ROW entry restriction. Land Use Authorizations and management under Alternative C would restrict the most amount of land for ROW entry and development of all the alternatives.

Effects under Alternative D

Alternative D would manage 564,100 acres as ROW exclusion and 1,226,100 acres as ROW avoidance, totaling 1,790,200 acres of ROW entry restriction. This is more than Alternative A.

Effects under Alternative E

Alternative E would manage 605,900 acres as ROW exclusion and 1,448,200 acres as ROW avoidance totaling 2,054,100 acres of ROW entry restrictions. This is more than Alternative A.

Minerals: Effects from Areas of Critical Environmental Concern

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under Alternative A, 6 ACECs (21,800 acres) would continue to be managed. Of these, 4 ACECs would restrict locatable mineral entry, but would be open to fluid mineral leasing, nonenergy mineral leasing, and mineral material disposal. Areas not proposed to be withdrawn from locatable mineral entry would require a plan of operations. Alternative A would be the least restrictive of mineral development within ACECs of all the alternatives.

The BLM would manage the Carson Wandering Skipper ACEC with restrictions on mineral withdrawal until the activity plan is complete. This would be less restrictive of mineral resources than Alternative C, which is the only other Alternative that would manage this ACEC.

The BLM would manage the Pah Rah High Basin Petroglyph ACEC with restrictions on mineral withdrawal until the activity plan is complete. Alternatives B and D would continue this withdrawal, and Alternative C and E would require additional restrictions for mineral entry within this ACEC.

Alternative A would continue the withdrawal from locatable mineral entry in the Virginia Range Williams Combleaf Botanical ACEC, as would Alternatives B through E. The BLM would place the fewest restrictions on mineral development within this ACEC.

Effects under Alternative B

Under Alternative B, 4 ACECs would continue to be managed and 9 ACECs would be proposed for designation, totaling 371,170 acres. Of these, 7 ACECs would restrict impose stipulations or closures to fluid mineral leasing, and 4 would withdraw the ACEC from locatable mineral entry. Alternative B would not have any restrictions on nonenergy or mineral material disposal. Alternative B would impose more restrictions on mineral development than Alternative A.

Alternatives B and D would manage the Black Mountain/Pistone Archaeological Site with CSU stipulations for fluid mineral leasing. These alternatives would place fewer restrictions on fluid mineral leasing than Alternative C, which would manage this site with NSO stipulations. Alternatives A and E would not manage this area as an ACEC.

Alternatives B and D would manage the Grimes Point Archaeological District with NSO stipulations for fluid mineral leasing. The BLM would place more restrictions on mineral development under these alternatives than under Alternatives C and E, which would recommend the ACEC for withdrawal from locatable mineral entry.

Alternative B would manage the Namazii Wunu Cultural ACEC with CSU stipulations for fluid mineral leasing. The BLM would place fewer restrictions on fluid mineral leasing than Alternative C, the only other alternative that would designate this ACEC.

Alternatives B and D would continue the current withdrawal from locatable mineral entry within the Pah Rah High Basin Petroglyph, similar to Alternative A. The BLM would place more restrictions on mineral development under these alternatives than under Alternatives C and E.

Alternative B would re-establish the 1,420 acre locatable mineral withdrawal on the Stewart Valley Paleontological ACEC, and would apply NSO stipulations for fluid mineral leasing throughout the ACEC. This is more restrictive than Alternative A, which would not require any mineral entry restrictions.

Alternatives B and D would manage the Tagim aša Cultural ACEC with CSU stipulations for fluid mineral leasing.

Alternatives B and E would manage the Virginia Range Williams Combleaf Botanical ACEC as closed to fluid mineral leasing, and would continue the withdrawal from locatable mineral entry. This is more restrictive than Alternative A.

Effects under Alternative C

Alternative C would continue to manage 5 ACECs and would propose the designation of an additional 18 ACECs, totaling 786,270 acres. Of these, 18 ACECs would be restricted or closed to fluid mineral leasing, 21 would be withdrawn from locatable mineral entry, 8 would be closed to nonenergy mineral leasing, and 11 would be closed to mineral material disposal. There would be 6 ACECs that would restrict any form of mineral development. ACEC management under Alternative C would result in the BLM placing the most restrictions on mineral development.

The BLM would apply NSO stipulations for fluid mineral leasing on the Black Mountain/Pistone Archaeological Site. This is more restrictive than Alternative B and D, which would manage this ACEC with CSU stipulations on fluid mineral leasing. This ACEC would not be designated under Alternatives A or E.

The Carson Wandering Skipper ACEC would continue to be withdrawn from locatable mineral entry, and would be closed to fluid mineral entry and nonenergy leasable minerals. This would be more restrictive of mineral resources than Alternative A, which is the only other Alternative that would manage this ACEC.

The Churchill Narrows Buckwheat Botanical ACEC would be recommended for withdrawal from locatable mineral entry, and would be closed to fluid mineral entry, nonenergy leasable minerals, and mineral material disposal.

The BLM would recommend the Clan Alpine Greater Sage-Grouse ACEC for withdrawal from locatable mineral entry, and manage the ACEC as closed to fluid mineral leasing, and mineral material disposal. Alternative C would be the only Alternative that would designate this ACEC.

The Desatoya Greater Sage-Grouse ACEC would be recommended for withdrawal from locatable mineral entry with 3.25 miles of active leks, and would be closed to fluid mineral leasing and mineral material disposal. Alternative C would be the only Alternative that would designate this ACEC.

The BLM would recommend the Dixie Valley Toad ACEC for withdrawal from locatable mineral entry, and would apply NSO stipulations for fluid mineral leasing. Alternative C is the only Alternative that would designate this ACEC.

Alternative C would recommend the Fox Peak Cultural site for withdrawal from locatable mineral entry.

The Greater Sand Mountain ACEC would be recommended for withdrawal from locatable mineral entry under Alternative C, which would be more restrictive than Alternative A.

Alternatives C would manage the Grimes Point Archaeological District with NSO stipulations for fluid mineral leasing, and as recommended for withdrawal from locatable mineral entry. This is more restrictive than Alternative A.

The BLM would manage the Incandescent Rocks Scenic ACEC as closed to fluid mineral entry, nonenergy mineral leasing, and mineral material disposal, as well as recommended for withdrawal from locatable mineral entry. This would be more restrictive than Alternative A.

Alternative C would manage the Lassen Red Rock Scenic ACEC as closed to fluid mineral leasing, nonenergy mineral leasing, mineral material disposal, and as recommended for withdrawal from locatable mineral entry. Alternative C is the only alternative that would designate this ACEC.

Alternative C would manage the Namazii Wunu Cultural ACEC as closed to fluid mineral leasing, nonenergy mineral leasing, mineral material disposal, and as recommended for withdrawal from locatable mineral entry. This is more restrictive than Alternative A.

Alternative C would recommend the Pah Rah High Basin Petroglyph for locatable mineral withdrawal, and would apply NSO stipulations for fluid mineral leasing. The BLM would place more restrictions on mineral development under Alternative C than under Alternative A.

The BLM would manage the Pine Nut Bi-State Sage Grouse ACEC as closed to fluid minerals and mineral material disposal, as well as recommended for withdrawal from locatable mineral entry within 3.25 miles of active lek sites. Alternative C would be the only alternative that would designate this ACEC.

The Pine Nut Mountains Williams Combleaf Botanical ACEC would be recommended for withdrawal from locatable mineral entry under Alternatives C and D. These are the only alternatives that would designate this ACEC.

Alternatives C and E would manage the Ruhenstroth Paleontological ACEC as closed to fluid mineral leasing, nonenergy mineral leasing, and mineral material disposal, as well as recommended for withdrawal from locatable mineral entry.

The Sand Springs Desert Study Area ACEC would be recommended for withdrawal from locatable mineral entry. Alternative C is the only alternative that would designate this ACEC.

Alternative C would be the only alternative that would designate the Steamboat Buckwheat Botanical ACEC. This ACEC would continue to be withdrawn from locatable mineral entry and closed to mineral material disposal.

Alternatives C and E would re-establish the 1,420 acre locatable mineral withdrawal within the Stewart Valley Paleontological ACEC, and would manage

the ACEC as closed to fluid mineral leasing. This is more restrictive than Alternative A, which would not require any mineral entry restrictions.

Alternative C would manage the Tagima asa Cultural ACEC as recommended for withdrawal from locatable mineral entry and with NSO stipulations for fluid mineral leasing.

The BLM would manage the Virginia City National Landmark Historic District ACEC as closed to nonenergy mineral leasing and mineral material disposal, as well as managed with NSO stipulations for fluid mineral leasing under Alternative C.

Alternative C would recommend the Virginia Mountains Greater Sage-Grouse ACEC for withdrawal from locatable mineral entry, and as closed to fluid mineral leasing and mineral material disposal. Alternative C is the only alternative that would designate this ACEC.

Alternative C and E would manage the Virginia Range Williams Combleaf Botanical ACEC as closed to fluid mineral leasing, nonenergy mineral leasing, and mineral material disposal, as well as continue the locatable mineral withdrawal. This would be more restrictive than Alternative A.

Effects under Alternative D

Alternative D would continue to manage 3 ACECs and would propose the designation of an additional 8 ACECs totaling 180,000 acres. Impacts on mineral development from Alternative D would be similar to Alternative B. Alternative D would restrict or close fluid mineral leasing on 2 ACECs and would withdraw 3 ACECs from locatable mineral entry.

Alternative D would manage Black Mountain/Pistone Archaeological Site as Alternative B would.

Alternative D would manage the Grimes Point Archaeological District as Alternative B would.

The Incandescent Rocks scenic ACEC would be recommended for withdrawal from locatable mineral entry. This would be more restrictive than Alternative B, which would not have any mineral restrictions in this ACEC but less than Alternative E, which would be closed to fluid mineral leasing, and Alternative C, which would be closed to all mineral entry.

Alternative D would manage the Pah Rah High Basin Petroglyph as Alternative B would.

Alternative D would manage the Pine Nut Mountains Williams Combleaf Botanical ACEC the same as Alternative C would.

Effects under Alternative E

Alternative E would continue to manage 4 ACECs and would propose the designation of an additional 4 ACECs, a total of 82,770 acres. Alternative E would manage the 8 ACECs with restriction or closure to fluid mineral leasing and with locatable mineral withdrawal, and 2 of these ACECs as closed to nonenergy leasables and mineral material disposal as well. The BLM would place more restrictions on mineral development under Alternative E than under Alternative A.

The Churchill Narrows Buckwheat Botanical ACEC would be recommended for withdrawal from locatable mineral entry, and would be closed to fluid mineral leasing.

Alternative E would recommend the Fox Peak Cultural site for withdrawal from locatable mineral entry, and would close the ACEC from fluid mineral leasing

Alternatives E would manage the Grimes Point Archaeological District with as closed to fluid mineral leasing, and as recommended for withdrawal from locatable mineral entry.

The BLM would manage the Incandescent Rocks Scenic ACEC as closed to fluid mineral entry, and recommended for withdrawal from locatable mineral entry.

Alternative E would continue the withdrawal from locatable mineral entry at the Pah Rah High Basin Petroglyph ACEC, and close it to fluid mineral entry. Alternative E would result in the most restrictions on mineral development within this ACEC.

Similar to Alternative C, the BLM would manage Ruhenstroth Paleontological ACEC, Stewart Valley Paleontological ACEC, and Virginia Range Williams Combleaf Botanical ACEC as closed to fluid mineral leasing under Alternative E. The BLM would recommend a portion of the Stewart Valley Paleontological ACEC for withdrawal from locatable mineral entry, and the withdrawal would be maintained in the Virginia Range Williams Combleaf Botanical ACEC. Unlike Alternative C, the BLM would also recommend the Ruhenstroth ACEC for withdrawal from locatable mineral entry.

Minerals: Effects from National Trails

Effects Common to All Alternatives

National Historic Trails (NHTs) are cultural resources. Management of NHTs includes consideration of cultural, recreation, visual and natural landscape elements, values, qualities and settings, which results in restriction of development around NHTs. Under all alternatives the historical trails and associated historic sites and setting would be preserved and protected for public use and enjoyment.

Under all alternatives, the Grimes Point National Recreation Trail would not restrict mineral development or impose ROW avoidance or exclusion areas.

Effects under Alternative A

Alternative A would manage NHTs to ensure the protection of trail resources and preserve their interpretation and other public use. However, No specific management has been identified for the congressionally designated Pony Express and California NHTs.

Under Alternative A, the Grimes Point National Recreation trail was not designated with specific management identified.

Effects under Alternative B

Alternatives B through E would manage NHTs to preserve the historic and scenic values and the cultural landscapes and viewsheds associated with them.

Alternative B would manage NHTs as VRM Class II (0.25-mile buffer on either side of the centerline) and as a ROW avoidance area (0.25-mile buffer around the center line), and would mitigate for direct and indirect adverse effects on eligible, unevaluated, or high-potential segments and associated sites through avoidance, project redesign, data collection, interpretation, public education, or other means. Additionally, new audible and atmospheric effects will not exceed current levels where feasible.

Alternative B would open the NHT corridors to mineral material sales and disposals as long as the actions are compatible with VRM classification and the historic values.

Effects under Alternative C

Alternative C would manage NHTs as VRM Class II (2.5-mile buffer on either side of the centerline) and as a ROW avoidance area (2.5-mile buffer around the center line), and would mitigate for direct and indirect adverse effects on eligible, unevaluated, or high-potential segments and associated sites through avoidance, project redesign, data collection, interpretation, public education, or other means. Additionally, new audible and atmospheric effects will not exceed current levels along NHTs, and the BLM would seek opportunities to reduce noise levels.

Alternative C would also close the NHT corridor to nonenergy mineral leasing, mineral materials, and fluid mineral leasing within a 2.5-mile buffer.

Alternative C would also manage the designated Pony Express NHT as an ACEC (See Sand Springs Desert Study ACEC).

Effects under Alternative D

Alternative D would manage NHTs as Alternative B would.

Pony Express National Historic Trail

Alternative D would not designate the Pony Express NHT as and would not manage it as a cultural resource or an ACEC.

Effects under Alternative E

Alternative E would manage NHTs as VRM Class II (1-mile buffer on either side of the centerline) and as a ROW avoidance area (1-mile buffer around the center line), and would mitigate for direct and indirect adverse effects on eligible, unevaluated, or high-potential segments and associated sites through avoidance, project redesign, data collection, interpretation, public education, or other means. Additionally, new audible and atmospheric effects will not exceed current levels where feasible.

Alternative E would close high potential historic sites and high potential route segments along the NHT corridor to nonenergy and fluid mineral leasing and mineral material disposal within a 1-mile buffer on either side of the center line. The remainder of the NHT corridor would remain open to leasing and development as long as the actions were compatible with the historic values.

Alternative B would also manage the designated Pony Express NHT as an SRMA (See SRMAs and Cultural Resources).

Minerals: Effects from Wilderness Study Areas

Effects Common to All Alternatives

Managing acres as WSAs to maintain wilderness characteristics would restrict surface-disturbing activities. In accordance with BLM Manual #6330, Management of Wilderness Study Areas, the BLM would manage WSAs as VRM Class I, and as closed to fluid mineral leasing, nonenergy solid mineral leasing, and mineral material disposal. Additionally, WSAs are closed to fluid mineral leasing in accordance with the Federal Onshore Oil and Gas Leasing Reform Act of 1987. The existing designated WSAs and designated wilderness areas would continue to be open for rights to locatable minerals but would be managed with additional limitations or stipulations applied to operations authorizations, in accordance with BLM Manual #6330 Management of Wilderness Study Areas (BLM 2012e). The BLM would continue to manage 9 WSAs, totaling 94,200 acres, until Congress either designates these areas or releases them for other purposes.

Effects under Alternative A

Management of WSAs would be the same as those described under *Effects Common to All Alternatives*. In addition, Alternative A would manage WSAs by limiting motorized travel to existing ways and trails. Alternative A does not provide management actions should a WSA be released by Congress.

Effects under Alternative B

Management of WSA would be the same as described for Alternative A.

If WSAs are released by Congress, the BLM would manage the land areas as VRM Class II, except for the Clan Alpine WSA, which would be managed as VRM Class III. A Class II designation would retain the existing character of the landscape, keeping the level of change to the characteristic low. Management activities may be seen, but should not attract the attention of the casual observer, and any landscape changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. While this VRM classification would influence how exploration and development would occur on the lands once a part of the WSAs, mineral development would not be prohibited.

Effects under Alternative C

Management of WSAs would be the same as those described under *Effects Common to All Alternatives*. In addition, Alternative C would manage WSAs by closing them to motorized and mechanized travel. This would restrict opportunities to explore or develop minerals within WSAs.

If WSAs are released by Congress, the BLM would manage most of the land areas as VRM Class II and all of the areas as closed to nonenergy mineral leasing, mineral material disposal, and fluid mineral leasing. The BLM would also recommend the lands for withdrawal from locatable mineral entry and manage as ROW exclusion. Alternative C would not open any land areas now managed as WSAs to mineral development should the WSA be released by Congress.

Effects under Alternative D

Management of WSA would be the same as described for Alternative A.

If WSAs are released by Congress, the BLM would manage most of the land areas as VRM Class II. The BLM would manage the Carson Iceberg area as closed to fluid mineral leasing and as a ROW avoidance area. These management actions are similar to Alternative B in that the VRM classification would retain some restriction on mineral development should WSA designation be released by Congress.

Effects under Alternative E

Management of WSA would be the same as described for Alternative A.

If WSAs are released by Congress, the BLM would manage most of the land areas as VRM Class II, and all of the areas as closed to fluid mineral leasing and as ROW avoidance areas.

The BLM would manage Carson Iceberg as VRM Class I. The BLM would manage the portion of Job Peak that overlaps with the Fox Peak Cultural ACEC (43,300 acres) as part of that ACEC.

Due to these land use restrictions and the conversion of the Carson Iceberg to an ACEC if it were released from WSA designation by Congress, Alternative D would be more restrictive of mineral development than Alternative A.

Minerals: Effects from Back Country Wildlife Conservation Areas

Effects under Alternative A

BCWCAs would not be delineated under Alternative A, so effects on mineral would not occur.

Effects under Alternative B

BCWCAs would not be delineated under Alternative B, so effects on mineral resources would not occur.

Effects under Alternative C

BCWCAs would be delineated to safeguard fish and wildlife habitat, existing dispersed non-motorized recreation opportunities, and access to back country areas. Alternative C would manage 817,800 acres as BCWCAs and would manage the areas as ROW exclusion areas except within existing ROWs, as closed to mineral material disposal and nonenergy mineral leasing, and with an NSO stipulation for fluid mineral leasing. These land use restrictions would reduce the potential for mineral exploration and development in comparison to areas without these land restrictions in place. Therefore, management of Back Country Wildlife Conservations areas under Alternative C would be more restrictive of mineral development than the other Alternatives.

Effects under Alternative D

BCWCAs would not be delineated under Alternative D, so effects on mineral resources would not occur.

Effects under Alternative E

BCWCAs would not be delineated under Alternative E, so effects on mineral resources would not occur.

Minerals: Cumulative Effects

Table 4-1 lists the past, present, and reasonably foreseeable cumulative actions for the CCD.

Invasive weeds are expected to continue to spread across the landscape. The BLM currently manages weed infestations through integrated weed management, including biological, chemical, mechanical, and educational methods. The proposed actions would require discretionary mineral developments to use certified weed free construction materials, and would require mineral material disposal developments to become certified weed free.

Management strategies and permit requirements, including implementation of mitigation measures and permit stipulations applicable to mining development to

protect or reduce impacts on sensitive resources would increase costs. Use restrictions in designated priority wildlife habitat and priority watershed areas would protect areas by limiting uses. The impacts on mineral development would vary based on the number of acres designated with use restrictions. Designation of priority wildlife habitat and watersheds, sensitive species management and ACECs would restrict certain uses needed to support mining operations affecting the costs and feasibility of projects. These impacts would be limited based on location, habitat conditions, and management discretion in those areas.

Trends indicate that the number of wildfires will continue to gradually increase based on climate, conversion of habitat to areas dominated by nonnative, invasive species, and increased potential for human caused fires due to population growth and increases in recreation uses. Wildfire impacts have included burned infrastructures and affected operations. Potential impacts have been addressed through construction of strategically placed fuelbreaks and suppression priorities. The implementation of ESR on areas burned by wildfire would continue based on the number of acres burned. ESR treatments would continue to be prioritized to provide for human life and safety, soil/water stabilization, restoration of important habitat for special status species, and to deter establishment of invasive plants. Large landscape scale fuelbreaks may afford additional protection to mining facilities from wildfire.

Mineral exploration and development is expected to continue to occur for locatable minerals, fluid mineral leasing, nonenergy mineral leasing, and mineral material disposables. There are approximately 23 plans of operations for locatable mineral exploration (greater than 5 acres) or mining currently administered, 260 contracts for free-use permits for salable mineral operations, and 148 geothermal leases currently leased (BLM 2013f). The National Renewable Energy Laboratory data shows that portions of the planning area have high potential for solar energy, and Luning Solar was issued a ROW grant for a 575-acre project in July, 2010 but construction has not started. Renewable energy projects would have few known impacts on mining.

Mining reductions in feasibility of operations proposed in those areas would be affected as salable, fluids, and solid leasable minerals may not be permitted or restricted. Permit stipulations and implantation of mitigation measures have affected the design and reclamation of facilities, increasing cost of operation and reclamation. Overall the incremental impacts on minerals would be moderate with lower impacts on locatable minerals and moderate impacts applicable to salable, moderate applicable to oil and gas and moderate to high for geothermal minerals and solid minerals leasing as fewer BLM-administered lands would be available for use.

Demands for land use authorizations in the planning area are anticipated to increase in correlation with future residential and commercial development in

response to increasing population and energy demands. Over the past 10 years the CCD has average issuance of approximately 28 ROW authorizations per year, with an average of 35 applied for annually. Land tenure adjustments may improve long-term mining in areas through mining company acquisition of BLM-administered lands around mine sites.

Areas closed or limited to existing route for travel management could impact discretionary mineral development through undesirable placement of roads, or inability to create new roads for direct routes.

4.4.4 Recreation and Visitor Services

This section discusses potential impacts on recreation from proposed recreation management actions and management actions of other resources and resource uses. Existing conditions are described in **Section 3.2.4**, Recreation and Visitor Services.

Summary

Continuing current management under Alternative A would likely deprive the recreationist of desired opportunities, experiences, and outcomes, and could result in user and resource conflicts. Adverse impacts would be expected where management for popular areas such as Wilson Canyon, Hungry Valley, and Dead Camel Mountain fail to provide adequate management direction for emerging recreation trends and increased visitation. These impacts would likely become significant in localized areas over the life of the plan.

Alternative B would provide management that facilitates desired recreational experiences and activities across the decision area, especially in popular areas that currently lack structured management. However, management of some Recreation Management Areas (RMAs; e.g., management as VRM Class IV) would allow for development that could conflict with RMA objectives and outcomes. The eastern part of the decision area would be at greatest risk because its back country setting could easily be changed to middle-country in the presence of new development.

Alternative C would provide the greatest restrictions on surface-disturbing activities and thus the greatest protection for recreational activities and experiences, especially those that depend on a quiet and/or back country landscape. However, this alternative would also result in fewer new recreational facilities and services over the life of the plan and the BLM would be unable to effectively manage a long-term increase in visitation.

Implementation of Alternative D would result in impacts in the urban interface area similar to those under Alternative B. If visitation in the rest of the decision area increases substantially, the BLM would not have the management tools necessary to facilitate beneficial recreational experiences and activities over the long-term.

Alternative E identifies recreation objectives supported with management actions that limit conflicting uses. A focus on recreational facilities and services in popular areas would improve users' experiences by directing them toward areas well-suited for their preferred activity.

Table 4-19, Impacts on Special Recreation Management Areas, displays the acres of selected resource allocations, in percentages, that overlap SRMAs under each alternative. The impact of limiting surface-disturbing activities depends on the specific SRMA's management objective and desired recreational setting characteristics (e.g., frontcountry or back country) and experiences. For example, a back country recreational setting characteristic could be easily changed to middle- or frontcountry because of ROW development. In general, a higher percentage of overlap in the table below results in less surface disturbance within SRMAs and, therefore, greater protection for recreational setting characteristics and experiences. Impacts on each individual SRMA are discussed in the analysis.

Table 4-19
Impacts on Special Recreation Management Areas

Management Action	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Closed to Fluid Mineral Leasing	99%	28%	90%	33%	58%
Closed to Mineral Material Disposal	0%	10%	76%	0%	22%
Closed to Nonenergy Leasing	0%	38%	76%	33%	36%
ROW Exclusion	0%	0%	69%	0%	0%
ROW Avoidance	0%	10%	8%	5%	23%

Sources: BLM GIS 2014a, BLM GIS 2014b

Table 4-20, Impacts on Extensive Recreation Management Areas, displays the acres of selected resource allocations, in percentages, that overlap ERMAs under each alternative. The impact of prohibiting or limiting a particular surface-disturbing activity depends on the specific ERMA's management objective. For example, some recreational activities are easily disturbed by ROW development whereas others are more tolerant of ROW development. In general, a higher the percentage of overlap in the table below results in less surface disturbance within ERMAs and therefore greater protection for recreational activities. Impacts on each individual ERMA are discussed in the analysis.

Table 4-20
Impacts on Extensive Recreation Management Areas

Management Action	Alternative A¹	Alternative B	Alternative C	Alternative D	Alternative E
Closed to Fluid Mineral Leasing	n/a	6%	52%	31%	12%
Closed to Mineral Material Disposal	n/a	6%	71%	4%	34%
Closed to Nonenergy Leasing	n/a	10%	71%	31%	35%
ROW Exclusion	n/a	2%	61%	4%	2%
ROW Avoidance	n/a	27%	10%	55%	40%

Sources: BLM GIS 2014a, BLM GIS 2014b

¹There are no ERMA's designated under Alternative A.

Methods of Analysis

Methods and Assumptions

The following methods and assumptions were used to assess the impacts recreation and visitor services:

- Substantial increases in recreation could increase user conflicts and create risks to public health and safety.
- Traditional recreational uses in the planning area will continue as populations grow, and an anticipated increase in motorized recreation, wildlife viewing, hiking, mountain biking, camping, pleasure driving, heritage appreciation, and new technology-based recreation will occur.
- The potential for resource impacts and conflicts between all types of users will increase with increasing use.
- Development and maintenance of improved facilities, especially recreation trails, will result in increased use.
- The incidence of conflicts between motorized and nonmotorized recreationists will increase with unmanaged use, especially in ERMA's where objectives target protection of a wide range of both motorized and nonmotorized activities.
- Demand for SRP's will increase.
- Shooting restrictions will restrict only target/projectile shooting within the urban interface or where public safety concerns exist. Shooting restrictions will not affect the lawful taking of game.
- Managing areas as SRMA's will lead to economic growth and improved quality of life in surrounding communities.

Indicators

The following indicators were used to assess the degree of impacts on recreation and visitor services:

- Changes to the recreation opportunities and recreation setting characteristics in SRMAs
- Impediments to defined recreation activities and the associated qualities and conditions in ERMAs
- Management actions that result in short- or long-term elimination or reduction of recreation opportunities, activities, or experiences throughout the planning area
- Management actions and allowable use restrictions that result in increased conflict between recreation users and between other resource uses and recreation

Nature and Type of Effects

Recreation experiences and the attainment of a variety of outcome-focused objectives are vulnerable to any management action that would alter the settings and opportunities in a particular area. Recreation settings are based on a variety of attributes, such as remoteness, the amount of human modification in the natural environment, evidence of other users, and restrictions and controls (see **Appendix H**, Description of Recreation Management Areas, for a description of recreation settings). Management actions that greatly alter such features could affect the capacity of a particular landscape to support appropriate recreation opportunities and corresponding outcome-focused objectives.

Impacts on recreation are generally the result of conflicts between recreational uses (e.g., motorized versus nonmotorized use), management actions related to other resources and resource uses (e.g., habitat protection/restoration and livestock grazing), and stipulations placed on resource uses. The analysis of impacts on recreation focuses on these three types of impacts and is structured under three subheadings: the decision area, SRMAs, and ERMAs, as follows:

- Management actions for each SRMA are analyzed to determine if they 1) sustain or enhance recreation objectives, 2) protect the desired recreation setting characteristics, and 3) constrain uses, including incompatible recreation activities that are detrimental to meeting recreation or other critical resource objectives (e.g., cultural or threatened and endangered species).
- Management actions for individual ERMAs are analyzed to determine whether they facilitate the visitor's ability to participate in outdoor recreation and protect the associated qualities and conditions.

- The decision area discussion provides a broader analysis of impacts on recreation arising from implementing management for other resource programs that could occur over the entire decision area, including those areas managed as SRMAs or ERMAs.

Proposed recreation management under each alternative would also impact regional recreation conditions. For example, opportunities provided, or not provided, in the decision area would affect recreation use on surrounding federal, state, and local lands.

Management of soil and water quality, vegetation, fish and wildlife, and special status species includes the application of NSO, CSU, and TL stipulations (refer to **Table 2-1** for acreages). These stipulations would improve recreation by limiting or prohibiting development that could conflict with recreational activities, experiences, and outcomes. The magnitude of impacts on recreation would be directly related to the acreage affected by NSO, CSU, and seasonal restrictions and closures under each alternative.

Temporary or permanent restrictions associated with cultural resource areas, especially when they are collocated in recreation emphasis areas, could result in closing these areas to certain recreation activities. However, if impacts could be properly mitigated by, for example, interpretive signing and stabilization to protect these sites, then visitors would be able to enjoy them over the long term.

In VRM Class I and II areas, recreation objectives would be protected by maintaining the scenic quality of those lands. VRM Class I and II designations could restrict development of recreation facilities, such as campgrounds and trails, which could alter the opportunity to enhance recreation in these areas. However, VRM Class I and II designations would protect the naturalness of the physical setting, thereby enhancing opportunities to participate in recreation in less-developed settings. VRM Classes III and IV would not likely affect the type or amount of recreation use because management would generally be consistent with the construction of facilities to support recreation; however, VRM Classes III and IV would allow more change and contrast to the natural landscape, at the expense of visitors who prefer recreating in less-developed settings.

Impacts on recreation from areas open to all classes of livestock grazing could include conflicts with unsocialized sheep guard dogs, as well as livestock trampling vegetation and manure impacts at popular recreation sites (e.g., campsites and trails). The intensity of the impact would vary with the visitor's expectation for recreating in areas where livestock grazing is present. In addition, developing livestock grazing facilities can impact the naturalness of the physical setting over the long term because features such as stock ponds and catchments contrast with the natural landscape. However, properly placed range improvements that protect and promote land health enhance the naturalness of an area by managing utilization in support of the natural

surroundings. Range improvements could help to reduce conflicts with recreationists by prohibiting animals from wandering onto roads, trails, or developed recreation sites.

On lands open to fluid mineral leasing and geophysical exploration, if developed, any additional oil and gas facilities, equipment, noise, dust, vehicles, night lighting, pipelines, and human activity would alter the recreation setting in certain areas during construction and operation. This would interfere with recreationists' goals and would influence their opportunities and activities. However, applying NSO stipulations would retain the natural character of the landscape, while maintaining recreation opportunities in those areas in the long term. Applying CSU stipulations could reduce recreation opportunities by permitting development that conflicts with desired recreation.

Minerals development and disposal would result in short- and long-term impacts during construction and operations by displacing recreation opportunities and degrading scenic qualities in the areas.

Areas managed as unsuitable for public utilities (i.e., ROW exclusion areas) would protect recreation opportunities and the natural setting. The naturalness and remoteness could change over the short term and long term by the continued presence of communication sites (regardless of whether additional facilities were allowed at each site). These qualities also could be changed by areas identified as open to development of major utility corridors, or they could be impacted by developed recreation sites and trails during construction and operation. This all would depend on the location of the corridor or development. In turn, the social and operation setting characteristics could change in these areas. Managing areas as ROW avoidance would limit development that could be incompatible with recreation in these areas.

Development of renewable energy projects could result in the loss of recreation opportunities.

Managing ACECs would restrict surface-disturbing activities in those areas and would help maintain the existing physical setting by preserving natural landscapes.

In the WSR eligibility analysis, recreation identified as an Outstandingly Remarkable Values (ORV) for the Carson River Segments 1, 2, and 3. As such, recreational boating and fishing, including ensuring sufficient flows, would be protected or enhanced as a result of protecting the recreational ORV.

Implementing management for the following resources and resource uses would have negligible or no influence on recreation and are therefore not discussed in detail: climate management, land with wilderness characteristics, socioeconomic conditions, and environmental justice.

Recreation and Visitor Services: Effects from Air Quality Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Continuing to limit OHV use in areas of severe erosion hazard susceptibility and in watersheds where OHV use is causing flood and sediment problems would limit recreational opportunities in those parts of the decision area. However, these areas provide lower-quality experiences than those on well-designed routes or more durable surfaces, so the impact on OHV recreation would continue to be minimal.

Effects under Alternative B

Implementing BMPs and mitigation measures may limit recreational opportunities in certain parts of the decision area. However, the flexibility to apply these measures on a case-by-case basis would likely reduce adverse impacts on recreation.

Effects under Alternative C

Impacts would be the same as described under Alternative B.

Effects under Alternative D

Impacts would be the same as described under Alternative B.

Effects under Alternative E

Impacts would be the same as described under Alternative B.

Recreation and Visitor Services: Effects from Soil Resources

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Continuing to limit OHV use in areas of areas of severe erosion hazard susceptibility and in watersheds where OHV use is causing flood and sediment problems would limit recreational opportunities in those parts of the decision area. However, these areas provide lower-quality experiences than those on well-designed routes or more durable surfaces, so the impact on OHV recreation would continue to be minimal.

Effects under Alternative B

Restrictions on surface-disturbing activities on steep terrain could limit the placement of certain recreation facilities, although facilities are not often sited for areas with steep slopes. BMPs and soil restoration activities could include restrictions on travel, thereby reducing recreational access over the short- and long-term in site-specific areas.

Effects under Alternative C

Effects would be the same as described under Alternative B.

Effects under Alternative D

Effects would be the same as described under Alternative B.

Effects under Alternative E

Effects would be the same as described under Alternative B.

Recreation and Visitor Services: Effects from Water Resources

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

There would continue to be a loss of OHV opportunities in certain parts of the decision area due to site-specific limitations in areas with sensitive water resources.

Effects under Alternative B

Land acquisition that improves access to streams or high-quality wildlife habitat could improve opportunities for hunting and fishing.

Effects under Alternative C

Land acquisition that improves access to streams or high-quality wildlife habitat could improve opportunities for hunting and fishing. Protective measures in priority watersheds may limit recreational access or motorized travel, but would improve opportunities for undeveloped and quiet recreation by precluding many types of surface-disturbing activities.

Effects under Alternative D

Effects would be the same as under Alternative C.

Effects under Alternative E

Effects would be the same as under Alternative C.

Recreation and Visitor Services: Effects from Vegetation Resources

Effects Common to All Alternatives

Efforts to improve vegetative communities, especially riparian areas, would improve recreational opportunities such as hunting and fishing by providing better-quality habitat for fish and game.

Vegetation treatments would alter recreational opportunities over the short- and long-term by changing the physical setting and viewshed. Over the long-term vegetation treatments would be expected to improve recreation by improving the landscape.

Effects under Alternative A

The BLM would continue to manage rangelands to improve recreational opportunities, benefiting recreation in those parts of the decision area.

Effects under Alternative B

There would be no action to manage rangelands to improve recreational opportunities and no resultant benefits to recreation. Other management actions would result in impacts similar to those described under *Effects Common to All Alternatives*.

Effects under Alternative C

Effects would be the same as described under Alternative B.

Effects under Alternative D

Effects would be the same as described under Alternative B.

Effects under Alternative E

Effects would be the same as described under Alternative B.

Recreation and Visitor Services: Effects from Fish and Wildlife Management

Effects Common to All Alternatives

Habitat improvement projects and restrictions on surface-disturbing activities, including TL stipulations, would improve and protect wildlife habitat and improve hunting and wildlife viewing opportunities in those areas.

Effects under Alternative A

Efforts to sustain big game populations and coordinate with partners such as NDOW would continue to benefit hunting opportunities by providing adequate habitat conditions.

Effects under Alternative B

The BLM would implement several measures to protect wildlife habitat seasonally and year-round. These actions would improve hunting and wildlife viewing opportunities throughout the decision area. Closing access to caves in order to prevent transmittable diseases to bats would restrict recreational opportunities to cavers.

Effects under Alternative C

The BLM would apply the most restrictions on surface-disturbing activities under Alternative C, providing the greatest benefit to hunting and wildlife viewing.

Effects under Alternative D

Effects would be similar to those under Alternative C, but would only apply to the urban interface zone, meaning there would be reduced opportunities to

improve hunting and wildlife viewing opportunities elsewhere in the decision area.

Effects under Alternative E

Effects would be similar to those under Alternative B except that restrictions would be more stringent and thus benefits to hunting and wildlife viewing would be greater.

Recreation and Visitor Services: Effects from Special Status Species Management

Effects Common to All Alternatives

Avoiding disturbance in areas near raptors and other special status species birds during breeding seasons would seasonally reduce recreation opportunities in areas managed as closed to public access. Protection of these species would, however, benefit wildlife viewing during other times of the year.

Effects from ACEC designations related to special status species values are described in that section.

Effects under Alternative A

Fencing and temporary OHV restrictions would continue to limit recreational opportunities in certain areas. Efforts to improve special status species habitat would provide indirect benefits to hunters if the habitat were also used by game species.

Effects under Alternative B

Avoiding surface and noise disturbance to raptors and other special status species birds during breeding seasons would seasonally reduce recreation opportunities in areas managed as closed to public access. Protection of these species would, however, benefit wildlife viewing during other times of the year.

Habitat improvement projects for Greater Sage-Grouse and associated restrictions on surface-disturbing activities may limit the placement of recreational facilities but would generally improve wildlife viewing opportunities.

Closing Carson wandering skipper habitat near Winnemucca Ranch Road to motorized travel would force motorized users to go elsewhere in the decision area, but would improve wildlife viewing opportunities by eliminating disturbances and noise.

Effects under Alternative C

Prohibiting disturbance in areas near raptors and other special status species birds during breeding seasons would seasonally reduce recreation opportunities in areas managed as closed to public access. Protection of these species would, however, benefit wildlife viewing during other times of the year.

Effects from Greater Sage-Grouse and Carson wandering skipper management would be similar to those under Alternative B.

Effects under Alternative D

Effects from raptor, Greater Sage-Grouse, and Carson wandering skipper management would be similar to those under Alternative B.

Effects under Alternative E

Effects from raptor, Greater Sage-Grouse, and Carson wandering skipper management would be similar to those under Alternative B.

Recreation and Visitor Services: Effects from Wild Horse and Burro Management

Effects Common to All Alternatives

Efforts to improve habitat conditions and forage would improve viewing opportunities by providing better and additional habitat for wild horses. However, herd maintenance or reduction actions could limit viewing opportunities over the long-term. Because these actions are presented in each alternative, it is anticipated that impacts on recreation would be similar under all alternatives.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Recreation and Visitor Services: Effects from Wildland Fire Ecology and Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Temporary restrictions on recreation areas and routes would continue to occur as the result of natural and human-caused ignitions, fire suppression activities, and restoration actions. Recreation experiences could be enhanced over the

long-term, as settings are restored to a more desirable condition complementary to recreational activities.

Effects under Alternative B

Utilizing a full range of fire management activities (as outlined in the fire management plan) and options would result in greater flexibility to protect recreational facilities and opportunities.

Effects under Alternative C

Applying minimum impact suppression tactics would result in the potential for larger fires and greater disturbance to recreational opportunities.

Effects under Alternative D

Effects would be the same as under Alternative B.

Effects under Alternative E

Effects would be the same as under Alternative B.

Recreation and Visitor Services: Effects from Cultural Resources Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Continuing to promote visitation and interpretation in certain areas could reduce vandalism and result in a long-term improvement of cultural resource viewing opportunities.

Effects under Alternative B

Protection of historic roads and trails would benefit recreation by reducing surface-disturbing activities that could degrade users' experiences.

Effects under Alternative C

Effects from historic road and trail management would be the same as under Alternative B, but would occur over a larger area and provide greater benefits.

Effects under Alternative D

Effects from historic road and trail management would be the same as under Alternative B.

Effects under Alternative E

Effects from historic road and trail management would be the same as under Alternative B, but would occur over a larger area and provide greater benefits.

Recreation and Visitor Services: Effects from Paleontological Resources Management

Effects Common to All Alternatives

Under all alternatives, recreationists would continue to benefit from opportunities to engage in casual collection activities. Impacts from management actions associated with paleontological surveys would not vary by alternative. Requiring these surveys in highly sensitive areas could limit actions such as facility construction, resulting in the diminished potential for new recreation amenities in certain areas.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Recreation and Visitor Services: Effects from Visual Resources Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

The BLM would continue to manage 602,400 acres as VRM Class I and II areas where outcomes-focused objectives would be protected by maintaining the scenic quality of those lands. Managing 320,600 acres as VRM Class III would not likely affect the type or amount of recreation use in these areas because the construction of facilities to support recreation would be permitted. The 385,700 acres managed as VRM Class IV would allow the potential for development that could degrade outcomes-focused objectives due to diminished scenic quality.

Effects under Alternative B

Effects would be similar to those under Alternative A, except that the BLM would manage many SRMAs and ERMAs as VRM Class III or IV. This would allow for greater flexibility in the type and placement of facilities to support activities and experiences in these areas, but may allow for development that conflicts with back country recreation.

Effects under Alternative C

Effects would be similar to those under Alternative B, except that the BLM would manage many SRMAs and ERMAAs as VRM Class II or III. This would allow for less flexibility in the type and placement of facilities to support activities and experiences in these areas, but would support back country recreation activities that benefit from a more natural-appearing landscape.

Effects under Alternative D

Effects within SRMAs and ERMAAs would be similar to those under Alternative B. In the remainder of the decision area, the BLM would manage more acres as VRM Class IV, allowing the greatest flexibility in location and type of facilities. These facilities may conflict with or support recreation depending on the types of activities and their reliance on a developed or natural-appearing landscape. Generally, Alternative D would support activities outside of SRMAs and ERMAAs that are compatible with a more developed landscape.

Effects under Alternative E

Effects would be similar to those under Alternative B, except that the BLM would manage many SRMAs and ERMAAs as VRM Class II, III, or IV. This wider range of VRM classifications would be more closely tailored to the desired activities and experiences in each area, generally benefitting recreation.

Recreation and Visitor Services: Effects from Caves and Cave Resources Management

Effects Common to All Alternatives

Under all alternatives, caves would continue to provide recreational value. Closure orders to protect cultural or biological (e.g., bats) resources would result in long-term loss of this type of recreational opportunity. Given that caves outside the decision area may be subject to similar restrictions, there could be a long-term loss of caving opportunities in the planning area. These restrictions would be applied on a case-by-case basis and effects would not vary across alternatives.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Recreation and Visitor Services: Effects from Forestry and Woodland Product Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Continuing to the VRM Class II area (Indian Creek Recreation Lands) that is highly visible from recreation developments as unsuitable for commercial timber harvest would protect recreation experiences by improving the opportunity for both consumptive and non-consumptive recreational enjoyment of wildlife.

Effects under Alternative B

Allowing vegetative product extraction and utilization for biomass could lead to short-term adverse impacts on recreation because there would be more disturbances to activities and experiences. Over the long-term, it may lead to improved recreational opportunities because fewer healthy forested landscapes would be available.

Effects under Alternative C

Limiting vegetative product extraction and utilization for biomass could lead to short-term benefits for recreation because there would be fewer disturbances to activities and experiences. Over the long-term, it may lead to diminished recreational opportunities because fewer healthy forested landscapes would be available.

Effects under Alternative D

Effects from biomass extraction and utilization would be similar to those under Alternative B.

Effects under Alternative E

Effects from biomass extraction and utilization would be similar to those under Alternative B.

Recreation and Visitor Services: Effects from Livestock Grazing Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Range improvements could help to reduce conflicts with recreationists by preventing animals from wandering onto roads, trails, or developed recreation sites like campgrounds. While grazing does not often conflict with desired

natural settings for recreation, trampling can degrade trail facilities when soils are wet and animals may pose a safety risk with certain activities.

Effects under Alternative B

Because the acres available and unavailable for livestock grazing would be similar to those under current management, impacts would be similar to those under Alternative A.

Effects under Alternative C

Closing additional allotments would have little impact on recreation because grazing does not often conflict with desired natural settings for recreation. However, removing livestock from areas with recreational trails and popular recreation areas may reduce the need for range improvements to help reduce conflicts between livestock and recreationalists and would improve the trail surface for users.

Effects under Alternative D

The acres managed as available and unavailable to livestock grazing and associated impacts would be similar to those under Alternative A.

Effects under Alternative E

Because the acres available and unavailable for livestock grazing would be similar to those under current management, impacts would be similar to those under Alternative A.

Recreation and Visitor Services: Effects from Geology and Mineral Management

Effects Common to All Alternatives

Maintaining existing withdrawals would benefit recreation by precluding these areas from mineral entry and associated disturbance to recreational activities.

Applying BMPs and standard operating procedures would reduce short- and long-term impacts on recreation under all alternatives.

Effects under Alternative A

If the Sand Mountain Recreation Area is withdrawn from mineral entry, it would provide a long-term benefit to recreation by limiting this type of potential conflict with recreational activities.

Continuing to manage 839,100 acres as closed to fluid mineral leasing would prohibit development and infrastructure that could conflict with desired recreation activities and experiences.

Effects under Alternative B

Effects would be similar to those under Alternative A, except that NSO and CSU stipulations would be applied to 404,600 and 2,120,200 acres respectively,

prohibiting or limiting development that may conflict with certain recreational activities and experiences.

Effects under Alternative C

Under Alternative C, the BLM would close 2,081,700 acres to fluid mineral leasing and apply 1,039,200 acres with NSO stipulations and 1,242,800 acres with CSU restrictions. These closures and use restrictions would limit mineral development would benefit many types of recreation uses and reduce potential conflicts.

Effects under Alternative D

Fluid minerals management would close 737,000 acres to fluid minerals and would apply NSO stipulations to 864,800 acres and CSU stipulations to 2,071,400 acres. Potential impacts on recreation would be greater than Alternative C but would have fewer impacts compared to Alternatives A and B as more acres would be have NSO and CSU restrictions.

Effects under Alternative E

Effects would be similar to those under Alternative B, however more acres would be closed to fluid minerals and salable minerals.

Recreation and Visitor Services: Effects from Recreation and Visitor Services

This section analyzes management actions in RMAs that affect the BLM's ability to facilitate targeted recreation opportunities, maintain desired recreation setting characteristics, and address visitor health and safety and user conflict. Therefore, the analysis necessarily discusses the impact of other resource programs' actions within RMAs, such as closure to fluid mineral leasing, VRM classification, etc., that are proposed as part of each RMA's management.

Effects Common to All Alternatives

In areas not managed as RMAs, because recreation opportunities, activities, and experiences would not purposefully be protected, recreation experiences and outcomes could be diminished by mineral materials sales, development of nonenergy leasable minerals, or other uses potentially incongruous with stated recreation objectives. Consumptive uses could also pose visitor health and safety and resource protection risks and could increase conflict among the different types of recreational users and between other resource uses and recreation.

Although no RMAs are specifically managed as closed to fluid mineral leasing or as ROW avoidance or exclusion areas, these restrictions often overlap RMAs when they are proposed to protect other resources, such as species habitat, that may be co-located with an RMA. Where these restrictions apply, they would generally benefit recreation by limiting the type of development that could interfere with recreational experiences and activities due to increased physical and visual disturbances. Because these restrictions are targeted at

protecting other resources such as water resources or fish and wildlife, they are considered an indirect effect on recreation.

All alternatives would allow recreational shooting on BLM-administered lands except where prohibited by statute or county ordinance. This would maintain existing shooting opportunities over the life of the plan.

Managing SRMAs and ERMAs would improve diverse recreational experiences in accordance with management objectives. Based on SRMA and ERMA management, potential increases in recreational use would occur.

Effects under Alternative A

Decision Area

Without objectives or actions to support recreational target shooting (i.e., development of new facilities), shooting opportunities would neither degrade or improve in the decision area. Likewise, a lack of structured management for SRPs would limit improvement of this program.

Under Alternative A, management of recreation would follow current BLM guidance and policy. Special Recreation Permits would continue to be issued on a case-by-case basis subject to site-specific NEPA evaluation. This approach would likely limit desired opportunities, experiences, and outcomes, and could result in user and resource conflicts over the long term. Adverse impacts would be expected where management for popular areas such as Wilson Canyon, Hungry Valley, and Dead Camel Mountain fails to provide adequate management direction for emerging recreation trends and increased visitation.

Indian Creek/East Fork Carson River and Walker Lake. By retaining current recreation management actions for the Indian Creek/East Fork Carson River and Walker Lake SRMAs, BLM would manage recreational experiences and visitation on a case-by-case basis. Management under alternative A may not address new and emerging issues or trends in recreational use in the long term.

No special recreation management would be provided for the rest of the decision area. This approach would likely deprive the recreationist of desired opportunities, experiences, and outcomes, and could result in user and resource conflicts. Adverse impacts would be expected where management for popular areas such as Wilson Canyon, Hungry Valley, and Dead Camel Mountain fail to provide adequate management direction for emerging recreation trends and increased visitation. These impacts would likely become significant in localized areas over the life of the plan.

Effects under Alternative B

Decision Area

SRPs would be managed to maintain a minimum setback of 0.25-mile, as appropriate, between populated areas (nearest occupied residence) unless an exception is issued by the authorized officer. The potential for conflicts between recreation permits and residents would be reduced. Commercial SRPs for shooting would not be authorized in WSAs, and within certain SRMAs and ERMAs. The rest of the decision area would be available for these SRPs and, as a result, impacts on commercial shooting activities would be minimal.

Management of the Lemmon Valley Motocross Area would continue to provide unique recreational opportunities for general, commercial, competitive motocross, and BMX uses. However, the BLM would protect resources from damage and provide for public safety by prohibiting the construction of or eliminating tracks within the motocross area that conflict; with management goals or resource objectives, do not meet industry standards, or compromise public health and safety. Users of the facility would benefit from partnerships to manage use and maintenance of the facility. If an easement is acquired through private land to secure public access to the facility, there would be long-term assurance that use could continue.

Maintaining a 0.25-mile setback to occupied residences for motorized recreation events and activities would also protect residents from noise and dust associated with SRP events.

SRMAs

Alpine. The BLM would strive to protect recreational setting characteristics that support nonmotorized recreational experiences by managing the SRMA and its three recreation management zones (RMZs) as VRM Class II and III. Impacts to the landscape setting would be allowed in accordance with VRM objectives and would protect nonmotorized setting characteristics within the SRMA. These actions would complement back- and middle-country recreational setting characteristics that are complementary to nonmotorized recreation. Allowing OHV staging at the Hangman's Bridge parking area may promote motorized use in an SRMA that is directed at supporting nonmotorized experiences. Maintaining the existing withdrawal for mineral entry in the Indian Creek Campground area would also protect areas within the Alpine SRMA from mineral development.

Dead Camel Mountain. Alternative B would manage the Dead Camel Mountain SRMA stressing multiple uses and would provide for a wide range of motorized and nonmotorized recreational opportunities. Managing the areas as open to motorized travel as VRM Class IV would allow for recreational activities and facilities that support motorized events. Providing facilities such as staging and camping areas and kiosks would be consistent with desired front-country

recreational setting characteristics. Planned motorized and nonmotorized SRP competitive events would be allowed on a first-come basis, which may limit issuance of SRPs if there are timing and location conflicts between events.

Hungry Valley. The BLM would manage the Hungry Valley SRMA as a multi-use recreational area promoting OHV based tourism, with supporting management actions designed to foster development of facilities and improve motorized access. Allowing motocross opportunities, providing for the development, maintenance and management of motocross facilities and designating the SRMA as open to cross-country travel, could lead to an increased potential for user conflict in heavily-traveled portions of the SRMA.

Sand Mountain. Eliminating the fee use designation would promote visitation and increase use overtime. The BLM would manage this SRMA for motorized and nonmotorized recreational activities while protecting sensitive resources, within three RMZs. The Dune RMZs would be open to motorized travel. The Desert Habitat RMZ would be closed to motorized travel and the Mining RMZ would limit motorized travel to existing roads and trails. The Desert Habitat RMZ would provide nonmotorized users a quiet landscape recreation experience. The other RMZs would provide motorized recreation. Managing the SRMA for VRM Class IV objectives and maintaining current facilities would maintain existing uses. If use were to grow substantially over the life of the plan, there would be an unmet need for new facilities. In the Desert Habitat RMZ, where motorized use would not be allowed, nonmotorized users would benefit from a quiet landscape. However, increased use in this RMZ may also result in an unmet need for new facilities.

Walker Lake. The proposed management actions would support the BLM's objective of managing this SRMA for developed and dispersed camping. Restricting camping to designated sites in the Sportsman's Beach RMZ and limiting motorized travel to existing roads and trails would benefit recreational experiences by preventing resource degradation that can accompany dispersed camping in sensitive areas.

Wilson Canyon. The proposed management actions would generally support BLM's objective of managing this SRMA for OHV touring and trail riding, developed site camping, and fishing and river access. However, OHV use would be limited to the West Walker River RMZ and motorized access to the river would be prohibited. This would result in reduced access to the river for those users, but river access for other users would be unaffected. The Wilson Canyon SRMA would prohibit issuance of SRPs for commercial target shooting in both RMZs restricting shooting opportunities.

ERMAs

Middlegate and Mina. Management actions for these ERMAs emphasize long distance trail riding for all- and utility terrain vehicles. Middlegate management

would include camping. Both would provide motorized recreational access and support OHV-based tourism. Proposed management would generally support the desired activities because there would be limited potential for development that could interfere with long-distance trail riding.

Mustang and 102 Ranch. The BLM would manage these ERMA's to support a variety of casual, nonmotorized activities such as bicycling, dog walking, photography, nature observation, hiking, river access, and camping areas). Management would include; providing parking areas and road maintenance. The 102 Ranch would be managed as a day use site with camping opportunities at Mustang. Based on implementation of facilities, recreational opportunities and experiences within the ERMA would be improved and the BLM would successfully facilitate the desired activities over the life of the plan.

Pah Rah. Management would emphasize mountain biking and hiking. Prohibiting overnight camping associated with SRP activities or events would potentially limit conflicts between users. Providing visitor services such as trail identification and route signage, information kiosks, and visitor use maps would inform the public about resource values and provide for public safety. Managing the ERMA as VRM Class III would likely complement opportunities for mountain biking, hiking, and environmental education because intensive development would be limited and recreational facilities could likely be constructed. Given current and forecasted use patterns, it is anticipated that user conflict would continue to not require specific management consideration.

Pine Nut. Management would provide recreational opportunities that emphasize motorized and mechanized recreation opportunities and would maintain up to 200 miles of designated, groomed loop trails for motorized use opportunities. Designation of this ERMA would provide management tools necessary to reduce conflicts to nearby residences. Improving visitor services, providing educational facilities, restricting motorized staging areas, and prohibiting mass start motorized events would direct users towards areas well-suited for motorized recreation while protecting residences from noise and dust associated with some motorized activities and events.

Reno Urban Interface. The BLM would provide additional services and facilities to maintain public access in this ERMA. As a result, recreation access would be protected and enhanced over the life of the plan. Providing visitor services such as trail identification and route signage, information kiosks, and visitor use maps would help direct OHV use away from urban interface areas. Developing new and relocating existing staging areas would reduce conflicts between OHV users near residential areas.

Salt Wells. The BLM would manage for casual use and dispersed recreation opportunities that emphasize long-distance trail riding for motorized and nonmotorized uses. Pursuing partnerships and providing additional visitor services in this area along with promoting recreational OHV based tourism

would encourage user input and stimulate local economies. Management as VRM Class IV has the potential to allow development that could reduce long distance trail riding opportunities depending on the location and extent of development.

Effects under Alternative C

Decision Area

Alternative C would prohibit commercial shooting SRPs within WSAs, certain SRMAs and within four ACECs. Areas outside of WSAs, certain SRMAs, and the four ACECs would still be available for commercial shooting SRPs.

Closing and rehabilitating the Lemmon Valley Motocross Area would eliminate a unique recreational opportunity on BLM-administered lands. Users would be forced to go elsewhere, increasing the potential for concentrated motorized travel use.

SRP management would maintain a minimum setback of 0.5-mile, as appropriate, between the nearest occupied residence unless an exception is issued by the BLM Authorized Officer. As a result, potential conflicts between and residents would be lower compared to Alternative B. This would better protect residences while reducing the area along the urban interface available to SRP events.

SRMAs

Alpine. Management would be the same as under Alternative B except that the BLM would manage the East Fork Carson River RMZ as VRM Class I. This would further limit alterations to the visual landscape, improve nonmotorized recreation experiences, and limit the feasibility to construct facilities for boat launching and other activities. Over the long-term it may reduce BLM's ability to support increased visitation and desired recreational experiences in that RMZ.

Sand Mountain. Managing this SRMA to protect sensitive species habitat and Native American values may be in conflict with the goal to provide motorized and nonmotorized recreational experiences if areas or routes in the Dune RMZ are closed to recreational use. Management as VRM Class II would be unlikely to adversely affect recreation unless there is a need for new facilities during the life of the plan. Managing the Dune RMZ, as open to motorized travel would provide access within the SRMA for motorized travel. Managing the Desert Habitat RMZ, as closed to motorized travel would restrict recreational use of the area. Having two RMZs with opposing travel management restriction could create conflicts between users.

Walker Lake. SRPs would not be authorized for organized, commercial and competitive based recreational activities. Commercial recreationists would have to seek other public lands for their recreational experiences. Prohibiting the

development of motorized and nonmotorized trails within the SRMA would protect resources but would also increase usage on existing trails. Four RMZs would be managed to limit OHV motorized travel to existing roads, routes, or trails. Resources within these areas would be protected from unrestricted motorized use. However, delineated roads, routes, or trails would be subject to repeated and possibly increased use and would reduce recreational experiences for users. VRM Class II management and trail construction would be complementary to the stated objective of managing the SRMA for recreational activities while limiting future development of facilities or expansion of developed and primitive camping areas. However, if use were to increase over the life of the plan, flexibility to accommodate additional users would be limited and desired recreational experiences may not be attained.

ERMAs

Bagley Valley. Management would provide passive recreation opportunities for backpacking, dispersed camping, fishing, and mountain biking while protecting cultural resources. Passive recreation use would be maintained through implementation of use restrictions that include closure of Bagley Valley to motorized travel, limiting mechanized travel in Bagley Valley to existing roads and trails, and prohibiting SRPs for competitive events. These actions would allow for a variety of recreational activities while reducing the potential for user conflict and would serve to protect cultural resources.

Dry Valley. Management would provide recreation opportunities for dispersed recreation including hiking, mountain biking, OHV use, horseback riding, and dispersed camping while protecting cultural resources. Limiting mechanized, horseback, and foot travel to designated routes and providing trail identification signage and kiosks would help direct users towards desirable routes and recreational opportunities and would also protect cultural resources from damage. Management as VRM Class III would limit development that could conflict with recreation.

Faye-Luther. Recreation management is for day use and would emphasize passive recreation opportunities such as hiking, biking, photography nature walks, and dog walking. Passive recreation would be maintained by prohibiting overnight camping, camp fires, and OHV use. Recreationists seeking overnight camping and motorized uses would lose opportunities in this ERMA. Creating connectivity between the Faye-Luther trail system and Tahoe Rim Trail would provide a long-term benefit to nonmotorized recreational activities in the ERMA and surrounding area.

Middlegate and Mina. Management would provide recreation opportunities for long distance trail riding for all- and utility terrain vehicles and motorcycles while protecting cultural resources. Not authorizing SRPs in these ERMAs would protect cultural resources but would limit recreation opportunities for

commercial shooting, groups engaged in long-distance trail riding, and other events requiring an SRP. These groups and organized events would have to look elsewhere for opportunities.

Mustang and 102 Ranch. Management of the ERMA, and the resultant effects, would be similar to those under Alternative B. Limiting the Mustang ERMA to day use only would reduce opportunities for overnight camping along the river. Prohibiting SRPs would limit permitted recreation events.

Pah Rah. Management of the ERMA would include providing opportunities for casual day use activities such as mountain biking and hiking while protecting cultural resources. No SRPs would be issued within the ERMA. Fewer conflicts to casual use activities would occur and cultural resources would be protected. However, opportunities for SRP use would not be provided.

Petersen. Nonmotorized recreational activities would benefit from having the Lassen Red Rock Scenic ACEC located within the ERMA; there would be stringent protections guarding against surface-disturbing activities that would diminish recreational activities. Excluding mountain biking from Petersen Ridge would provide a nonmechanized area for hikers and equestrians seeking that type of experience, but it would reduce the amount of mountain biking opportunities in the ERMA. Recreationists that require SRPs or who seek motorized and mechanized travel opportunities in the area would have to relocate activities to other areas.

Pine Nut. Effects would be similar to those under Alternative B, except that there would be further restrictions, including not pursuing access easements, no issuance of SRPs, and delineation of two RMZs. The Front RMZ would be managed for more passive recreation. The potential for conflict between passive recreationalists and motorized use would be higher within this RMZ.

Reno Urban Interface. Under Alternative C, management would include providing for recreation activities while protecting cultural resources. Eliminating the Lemmon Valley Motocross Area would result in the long-term loss of a popular and unique recreational amenity on BLM-administered lands. Users would be forced to look elsewhere. Prohibiting commercial and competitive events and restricting OHV staging areas would protect nearby residences from dust and noise, but would further diminish motorized recreation activities over the life of the plan.

Salt Wells. Managing the ERMA would be similar to Alternative B; however, recreation opportunities would also be managed to protect cultural resources. Prohibiting SRPs for commercial, organized, or competitive events would provide protection to cultural resources, but SRP users would be forced to seek those activities elsewhere.

Singatse. Not authorizing SRPs for motorized events would limit the type of motorized recreation that could occur in the ERMA. However, commercial motorized activities and organized groups would be allowed, helping to offset the loss of SRPs.

Virginia Mountains. Management would provide diverse recreation opportunities including passive, mechanical, and motorized travel. The potential for conflict between recreationalists could occur. Prohibiting SRPs would reduce the potential conflicts between groups from SRP events.

Virginia Range. Management would include providing diverse recreation opportunities while protecting cultural, historical and natural resources. These resources would be protected from use restrictions that would close the areas to mineral material disposal and prohibit SRPs. Providing route identification and signage would help visitors better enjoy their activities in the ERMA. Closing the area to mineral material disposal would eliminate a potential source of conflict with recreational activities while prohibiting competitive SRPs would focus those events in a smaller portion of the decision area. The potential for user conflicts between recreationalists would be reduced as SRPs would not be allowed.

Effects under Alternative D

Decision Area

Effects on target shooting would be similar to those under Alternative B, except that restricting shooting during times of high fire danger would result in seasonal reduction in shooting opportunities on BLM-administered land.

Pursuing a lease for the Lemmon Valley Motocross Area with a willing partner may lead to better maintenance and facility upgrades over the life of the plan if the partner is better equipped to perform such actions. Acquiring an easement to secure access to the facility would also result in a long-term benefit to users by ensuring motocross activities could continue.

SRMAs

Alternative D proposes management of four SRMAs.

Alpine. Effects would be similar to those under Alternative B except that BLM may be better able to protect desired recreational setting characteristics and recreational experiences in the East Fork Carson River RMZ by managing the RMZ as VRM Class II. This would limit the location and development of facilities.

Dead Camel Mountain. Management as VRM Class III would place some limitations on facility development and motorized recreation, but likely not enough to prevent attainment of desired recreational setting characteristics and recreational experiences for motorcycle riding and OHV events. The BLM's objectives address other resource demands, and user conflicts result from motorcycle riding and OHV events depending on the long-term popularity of

the area. Management would provide diverse recreational opportunities with an emphasis on motorized use while addressing other resource demands and user conflicts. Opportunities for passive recreationalists would be somewhat diminished.

Hungry Valley. Effects would be similar to those under Alternative B, except that the BLM would manage the SRMA as limited to existing routes for motorized travel (with the exception of the Moon Rocks RMZ, which would be managed as open to cross-country travel). This would reduce the potential for user conflict while still providing for OHV-related recreational experiences, especially because Alternative D would manage 100 miles of groomed trails as opposed to 50 miles under Alternative B.

Wilson Canyon. Effects would be similar to those under Alternative B. In addition, allowing overnight camping in the Walker River RMZ would provide additional beneficial recreational experiences.

ERMAs

Faye-Luther. Management of the ERMA, and the resultant effects, would be the same as under Alternative C. There would be additional support for equestrian use through maintenance and management of specific trails for that use (and hiking). This would provide a long-term benefit to equestrian use in the ERMA.

Mustang and 102 Ranch. Management of the ERMAs, and the resultant effects, would be the same as those under Alternative B.

Pah Rah. Effects would be similar to those under Alternative B.

Pine Nut. Management of the ERMA, and the resultant effects, would be the same as under Alternative B.

Reno Urban Interface. Management of the ERMA, and the resultant effects, would be the same as under Alternative B.

Effects under Alternative E

Decision Area

Effects on target shooting would be similar to those under Alternative B, except that restricting shooting during times of high fire danger would result in a seasonal reduction in shooting opportunities on BLM-administered land.

Effects on the Lemmon Valley Motocross Area would be the same as under Alternative D.

Effects from SRP management would be the same as those under Alternative B.

SRMAs

This alternative proposes six SRMAs.

Alpine. Effects would be similar to those under Alternative D, except OHV staging at Hangman's Bridge parking in the East Fork Carson River RMZ would be prohibited and would support emphases on nonmotorized recreation. The potential for recreation conflicts between boaters and OHV users would be reduced.

Dead Camel Mountain. Managing the SRMA for motorcycle riding and OHV events would be consistent with proposed management actions, including open and limited motorized travel designations, VRM Class IV, and the pursuing of partnerships with motorized recreation groups and other parties. Therefore it is likely that BLM will be able to maintain desired recreational setting characteristics and recreational experiences over the life of the plan.

Hungry Valley. Effects would be similar to those under Alternative D, except that prohibiting competitive rock-crawling SRPs within the Moonrocks RMZ and at Warm Springs Mountain would reduce opportunities for a competitive rock crawling experience. This same action would enhance experiences for other motorized users and casual rock crawling because these areas would always be available for such uses.

Sand Mountain. Managing four separate RMZs within the SRMA would allow BLM to provide specific experiences for users and provide greater flexibility to retain desired recreational setting characteristics. Across all RMZs, recreational experiences would benefit from managing the SRMA as closed to fluid mineral leasing and nonenergy mineral leasing and by restricting ROW development. While nonmotorized experiences would not be prioritized, the establishment of the Desert Habitat RMZ would provide a quiet recreational experience.

Walker Lake. The BLM would emphasize nonmotorized activities and experiences under Alternative E. VRM Class III may allow for development that introduces noise and other disturbances that could conflict with a quiet, nonmotorized experience. However, the development of a trail network west of Highway 95 would provide a focused trail experience to support nonmotorized recreation. Camping would be restricted in some areas, but generally the most popular and desirable camping spots would continue to be open to that use. For these reasons it is likely that BLM could achieve its objective to manage this SRMA with a focus on nonmotorized recreation.

Wilson Canyon. Effects would be similar to those under Alternative B, except that there would be no opportunities for parking and camping on the West Walker River bank within the West Walker River RMZ. This is expected to result in a negligible adverse effect on recreation because of the availability of parking and camping options on nearby lands.

ERMAs

Bagley Valley. Management of the ERMA, and the resultant effects, would be the same as under Alternative B.

Dry Valley. Management of the ERMA, and the resultant effects, would be the same as under Alternative B. In addition, providing connectivity for OHVs between Hungry Valley SRMA and Fort Sage SRMA (BLM CA-Eagle Lake Field Office) would greatly enhance OHV opportunities in the area.

Faye-Luther. Management of the ERMA, and the resultant effects, would be the same as under Alternative C, except there would be additional support to address user conflict, providing greater benefits for all users over the life of the plan.

Middlegate and Mina. Effects would be similar to Alternative B and proposed management actions would generally support long-distance trail riding opportunities over the life of the plan.

Mustang and 102 Ranch. Management of the ERMAs, and the resultant effects, would be similar to those under Alternative B. Limiting the Mustang ERMA to day use only would reduce opportunities for overnight camping along the river.

Pah Rah. Effects would be similar to those under Alternative B, with additional options for reducing user conflict should it become an issue over the life of the plan. This would further solidify BLM's ability to facilitate desired recreational activities.

Petersen. Allowing mountain biking on Petersen Ridge would help maintain current opportunities for that activity. Because the area does not receive high levels of use, it is anticipated that user conflict would continue to not require special management consideration (improving visitor services would direct users to areas best-suited to their activities). Prohibiting motorized competitive events would enhance opportunities for nonmotorized activities by eliminating a potential source of conflict. Managing the Lassen Red Rock RMZ would provide structured management support and improve recreational activities over the long-term.

Pine Nut. Management would be similar to Alternative B, resulting in similar effects. Under Alternative E, motorized use would be focused away from the Front Country RMZ to protect nearby residences from dust and noise. Structured management support for motorized recreation in the rest of the ERMA would help offset the loss of opportunities in the Front Country RMZ.

Reno Urban Interface. Management of the ERMA, and the resultant effects, would be the same as under Alternative B.

Salt Wells. Compared to Alternative B, there would be additional services and facilities to support long distance trail riding and organized, competitive, and commercial events. This would improve opportunities for those uses over the life of the plan. Management as VRM Class III would limit the location and extent of development that could conflict with recreation.

Singatse. Management under Alternative E would support motorized recreation by providing additional facilities such as staging areas and trails. This would maintain motorized recreational activities over the life of the plan. Management as VRM Class IV may result in development that could conflict with recreation, depending on the location and extend of development.

Virginia Mountains. Management actions would be the same as under Alternative C, but an emphasis would be placed on hiking, back packing equestrian riding, nature observation, photography and camping opportunities. If motorized use does not increase dramatically over the life of the plan, there would likely continue to be few conflicts between motorized and nonmotorized activities.

Virginia Range. Emphasizing different uses in different parts of the ERMA may reduce the potential for user conflict. Providing additional facilities and services (e.g., trailheads and signage) would improve the quality of recreational opportunities for all users. Closing the area to mineral material disposal would eliminate a potential source of conflict with recreational activities.

Recreation and Visitor Services: Effects from Comprehensive Travel and Transportation Management

Effects Common to All Alternatives

Comprehensive Travel and Transportation Management would limit recreation access into areas and in some cases improve access for recreational use, provide for protection of recreational areas, would promote user safety, and would serve to reduce conflicts among various uses of BLM-administered lands.

Effects under Alternative A

Under Alternative A, the BLM would continue to manage 3,840,300 acres of BLM-administered lands as unrestricted open travel management. Open travel management would maintain opportunities for cross-country motorized recreation and access to recreation areas. However, route proliferation in open areas from cross-country travel could degrade other users' experiences, especially those seeking more passive recreational experiences such as hiking, and could damage or degrade valuable resources important for recreation. Alternative A would also close 6,900 acres to motorized travel. Closed areas would restrict motorized access to areas used for recreation. Travel on approximately 924,300 acres would be managed as limited to existing roads and trails. Some access restrictions to recreation areas would be implemented. Also, concentrating use to existing roads or trails would increase the potential for user conflicts stemming from increased traffic. There would continue to be few

routes designated for specific uses, resulting in lower-quality user experiences and increased potential for user conflict. While managing routes as undesignated (i.e., open to all uses) would provide a wide range of recreational opportunities throughout the decision area, the potential for user conflict and trail degradation would continue to grow as these undesignated routes receive more use.

Effects under Alternative B

Under Alternative B, the BLM would manage travel on 95,300 acres as open, 4,300 acres closed, and 4,677,000 as limited to existing routes or trails. Managing 4,677,000 acres as limited to existing routes would result in a loss of cross-country recreational OHV and mechanized opportunities in many areas, although this experience is not currently popular with mechanized users. Limiting travel to existing routes could reduce opportunities for accidents and user conflict in highly-traveled areas. Compared to Alternative A, access to recreation areas would be restricted as 95,300 acres would remain open although fewer acres would be closed to motorized travel. Alternative B would substantially increase the amount of acres limited to existing routes and trails. Limited travel management would protect important resource for recreation use but would increase the potential user conflicts and traffic.

Effects under Alternative C

Alternative C would implement the most travel management restrictions compared to the other alternatives. OHV and mechanized designations would result in the same types of impacts as under Alternative B, but the area closed to these uses (1,190,500) would increase, meaning these experiences would be confined to a smaller area. The reduction in areas open to motorized and mechanized travel may cause some users to seek similar experiences elsewhere in the planning area or adjacent lands and could lead to a decrease in visitation levels within the decision area (i.e., BLM-administered lands).

Effects under Alternative D

A similar number of acres would be limited to existing routes and trails, resulting in impacts on OHV and mechanized use similar to those under Alternative B. Alternative D would close fewer acres compared to Alternative B but would also have fewer acres available as open. This alternative has more travel management restrictions compared to Alternatives A, B, and E, but fewer than Alternative C.

Effects under Alternative E

The number of acres designated as limited to existing routes and trails would be similar to Alternative B, as would OHV and mechanized allocations, and the resultant impacts. Alternative E would close a greater number of acres than Alternative B and would manage 55,700 acres as open.

Recreation and Visitor Services: Effects from Lands and Realty

Effects Common to All Alternatives

Under all alternatives, land tenure adjustments, including acquisition and disposal of land, would benefit recreation if the adjustment considers recreational values. Acquisitions can improve public access in areas with intermingled land ownership and can facilitate increased or improved access to recreation areas, such as river access points. Acquiring private or state inholdings would improve access and user enjoyment of BLM-administered lands, especially in SRMAs, which are managed for specific recreation experiences. The acquisition of access easements can also increase recreation use across the planning area.

Under all alternatives, development of potential pipelines and electricity transmission and distribution facilities could directly impact recreation during construction through temporary loss of access or closure of facilities. Indirect impacts from development in this corridor could include changes to scenic resources over the long term due to the presence of transmission lines and other facilities, which could degrade user experiences.

Valuable recreation areas would continue to be prioritized as a land acquisition criterion. This would enhance recreational opportunities on BLM-administered land and reduce conflicts between recreationists and private landowners within the planning area.

Effects under Alternative A

The BLM would continue to manage 564,100 acres as ROW exclusion areas, protecting recreation experiences by precluding development that may restrict recreational opportunities. There would continue to be 0 acres managed as ROW avoidance areas, meaning there would be few restrictions on ROW development that may conflict with recreational opportunities in the remaining portions of the decision area.

Continuing to identify 179,700 acres for disposal could reduce opportunities for recreation, but adverse impacts would be limited because the disposal criteria account for lands with recreational values.

Effects under Alternative B

Managing 580,000 acres as ROW exclusion areas would protect recreation experiences by precluding development that may restrict recreational opportunities. Managing 1,195,800 acres as ROW avoidance areas would present the potential for development that could conflict with desired recreational opportunities.

Effects from identifying 273,500 acres for disposal would be the same as under Alternative A, but would occur over a larger area.

Effects under Alternative C

Effects from ROW avoidance and exclusion allocations would be the same as under Alternative B, except that they would occur over a larger area, thereby providing greater protection for recreational opportunities.

No lands would be identified for disposal and recreational opportunities would not be diminished by land disposal actions.

Effects under Alternative D

Effects from ROW avoidance and exclusion allocations would be the same as under Alternative B, except that they would occur over a smaller area, thereby resulting in greater risk of diminished recreational opportunities.

Effects from identifying 332,500 acres for disposal would be the same as under Alternative A, but would occur over a larger area.

Effects under Alternative E

Effects from ROW avoidance and exclusion allocations would be the same as under Alternative B, except that they would occur over a larger area, thereby providing greater protection for recreational opportunities.

Effects from identifying 267,200 acres for disposal would be the same as under Alternative A, but would occur over a larger area.

Recreation and Visitor Services: Effects from Renewable Energy

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

There would continue to be the potential for reduced recreational opportunities in the 905,900 acres managed as variance areas for utility-scale solar development. Solar energy-generating facilities could change the viewshed and recreational access by introducing facilities in areas previously undisturbed.

There would continue to be no areas managed as ROW avoidance for wind energy, resulting in the potential for degradation of recreational experiences and activities in a larger area than under any of the action alternatives.

Effects under Alternative B

Effects from solar variance areas would be the same as under Alternative B, but would cover 773,400 acres, meaning the effects would cover a smaller area.

Managing 1,220,200 acres as ROW avoidance areas for wind energy projects would primarily protect undeveloped and back country recreation opportunities because the ROW avoidance area would be applied to sensitive areas such as VRM Class I and II.

Effects under Alternative C

Effects from solar variance areas would be the same as under Alternative B, but would cover 578,400 acres, meaning the effects would cover a smaller area.

Managing 2,073,200 acres as ROW exclusion areas for wind energy projects would increase protections for recreation experience by precluding development that may restrict recreational opportunities.

Effects under Alternative D

Effects from solar variance areas would be the same as under Alternative B, but would cover 672,100 acres, meaning the effects would cover a smaller area.

Managing 1,228,100 acres as ROW avoidance areas for wind energy projects would result in the same type of impacts as under Alternative B, but covering a larger area.

Effects under Alternative E

Effects from solar variance areas would be the same as under Alternative B, but would cover 629,900 acres, meaning the effects would cover a smaller area.

Managing 956,900 acres as ROW avoidance areas for wind energy projects would result in the same type of impacts as under Alternative B, but covering a smaller area. Managing 629,900 acres as ROW exclusion areas for wind energy would result in the same type of impacts as under Alternative C, but over a smaller area.

Recreation and Visitor Services: Effects from Areas of Critical Environmental Concern

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

The BLM would continue to manage 6 existing ACECs (21,800 acres), protecting opportunities for quiet and undeveloped recreation in those areas at the expense of recreational OHV access.

Effects under Alternative B

The BLM would manage 13 ACECs (371,170 acres), providing additional opportunities for quiet and undeveloped recreation compared to Alternative A. Limiting motorized and mechanized travel to existing routes in the Grimes Point Archaeological District ACEC would result in a loss of cross-country recreational opportunities.

Effects under Alternative C

The BLM would manage 786,270 acres within 23 ACECs and provide additional opportunities for quiet and undeveloped recreation than under current

management. Only the Black Mountain/Pistone Archaeological District, Desatoya Greater Sage-Grouse, Incandescent Rocks Scenic, and Virginia City National Landmark Historic District ACECs would be open to year-round motorized use, resulting in a long-term loss of OHV recreational opportunities.

Effects under Alternative D

Effects on quiet recreation opportunities would be similar to those under Alternatives B and C except that 180,000 acres would be managed as ACECs. Limiting motorized and mechanized travel to existing routes in the Grimes Point Archaeological District ACEC would result in a loss of cross-country recreational opportunities.

Effects under Alternative E

Effects on quiet recreation opportunities would be similar to those under Alternatives B and C except that 82,770 acres would be managed as ACECs. Because motorized and mechanized use would not be limited in any of the ACECs under this alternative, there would be no long-term loss in those types of recreational opportunities from ACEC designation.

Recreation and Visitor Services: Effects from Back Country Byways

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Recreational use of the Fort Churchill Byway would not be expected to diminish recreation use or affect recreation settings important to user experiences. Implementing Back Country Byway corridor management plans would identify facilities and management actions necessary to preserve recreational experiences and promote desired outcomes.

Effects under Alternative B

Recommending designation of the Marietta and New Pass to Hawthorne byways would have the potential for attracting additional recreation to those byway areas. However, recreational use of the byways is not expected to diminish recreation use or affect recreation settings important to user experiences. Implementing Back Country Byway corridor management plans would identify facilities and management actions necessary to preserve recreational experiences and promote desired outcomes.

Effects under Alternative C

Effects would be the same as those under Alternative B except that there would be fewer opportunities to experience the historic mining resources along the Marietta Byway.

Effects under Alternative D

Effects would be the same as those under Alternative C.

Effects under Alternative E

Effects would be the same as those under Alternative B.

Recreation and Visitor Services: Effects from National Trails

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

National trails would be managed to preserve and protect the historical trail remains, associated historic sites and historical settings that are important as recreational settings. Management of national trails could restrict recreation access in areas in order to protect trail remnants and historical settings.

Effects under Alternative B

Managing potential trail segments for consideration in the NRHP and providing recreation opportunities consistent with historic value of the NHTs would improve recreational experiences and would increase opportunities for learning and interpretation.

Effects under Alternative C

Effects would be the same as under Alternative B.

Effects under Alternative D

Effects would be the same as under Alternative B.

Effects under Alternative E

Effects would be the same as under Alternative B.

Recreation and Visitor Services: Effects from Wild and Scenic Rivers

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

In the WSR suitability analysis, recreation is identified as an ORV for Carson River Segments 1, 2, and 3, meaning recreational boating and fishing opportunities and experiences may be enhanced as a result of protecting that ORV. Recreation activities may be restricted if found to adversely impact other ORVs, the free-flowing nature, or the tentative classification of the affected segment. Only a limited number of trail crossings would be allowed in scenic and wild segments (i.e., Carson River Segments 1 and 3), reducing future potential for expanded recreation opportunities. Recreation would not be restricted in recreational segments (i.e., Carson River Segment 2), so long as ORVs are protected.

Effects under Alternative B

Stream segments would be released from interim management protection, meaning recreational boating and fishing opportunities and experiences on Carson River Segments 1, 2, and 3 would not be enhanced by long-term protection of the Recreation ORV. However, there would be fewer limitations on other recreational opportunities and experiences along this stream segment, increasing the potential for expanded recreation opportunities.

Effects under Alternative C

Effects would be the same as under Alternative A.

Effects under Alternative D

Effects would be the same as under Alternative A.

Effects under Alternative E

Effects would be the same as under Alternative A.

Recreation and Visitor Services: Effects from Wilderness Study Areas

Effects Common to All Alternatives

Opportunities for solitude or primitive and unconfined recreation and undeveloped recreation setting characteristics within WSAs would be protected under all alternatives. Primitive and back country settings, and a desirable area for nonmotorized/nonmechanized recreation, would be retained. Primitive and unconfined recreation within the WSAs also would be protected under all alternatives.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Recreation and Visitor Services: Effects from Back Country Wildlife Conservation Areas

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

There would continue to be no BCWCAs and recreationists would not benefit from any measures to protect quiet recreation opportunities in those areas.

Effects under Alternative B

There would be no BCWCAs and recreationists would not benefit from any measures to protect quiet recreation opportunities in those areas.

Effects under Alternative C

Because many surface-disturbing activities would be limited, managing 817,800 acres as BCWCAs would provide improved opportunities for quiet recreation, including hunting and fishing.

Effects under Alternative D

There would be no BCWCAs and recreationists would not benefit from any measures to protect quiet recreation opportunities in those areas.

Effects under Alternative E

There would be no BCWCAs and recreationists would not benefit from any measures to protect quiet recreation opportunities in those areas.

Recreation and Visitor Services: Effects from Tribal Interests

Effects Common to All Alternatives

Closures or mitigation measures implemented in response to Native American tribal uses could result in site-specific short- or long-term reductions in recreation. Because closures and mitigation measures are dependent upon tribal needs and requests, effects are not expected to vary across alternatives.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Recreation and Visitor Services: Effects from Public Health and Safety

Effects Common to All Alternatives

Closures or mitigation measures implemented in response to public health and safety management could result in site-specific short- or long-term reductions in recreation.

Effects under Alternative A

Current target shooting closures in the American Flat Mill, Pine Nut Road No. 2, and Moonrocks areas would reduce safety risks and the potential for user conflict in these popular areas.

Effects under Alternative B

Current target shooting closures would continue to provide improved public safety. A focused effort on providing public safety information would likely reduce public health and safety risks across the decision area and particularly around abandoned mines, in hazardous conditions, and near areas frequently used for recreational target shooting.

Effects under Alternative C

Effects would be the same as under Alternative B.

Effects under Alternative D

Effects would be the same as under Alternative B.

Effects under Alternative E

Effects would be the same as under Alternative B.

Recreation and Visitor Services: Effects from Interpretation and Environmental Education

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

There would continue to be no specific interpretation and environmental education actions and no opportunity for recreationists to benefit from them.

Effects under Alternative B

Increasing public knowledge, appreciation and understanding of BLM resources would benefit recreationists by providing additional information to improve the quality of their visits across the decision area.

Effects under Alternative C

The effects would be the same as described under Alternative B.

Effects under Alternative D

The effects would be the same as described under Alternative B.

Effects under Alternative E

The effects would be the same as described under Alternative B.

Recreation and Visitor Services: Cumulative Effects

The cumulative effects analysis area used to analyze cumulative impacts on recreation resources includes the planning area and all big game hunting units that intersect the planning area. Any activities that affect game populations would in turn impact the potential for realizing recreation benefits (e.g., wildlife viewing and hunting) because of the loss or gain of the number of animals. The cumulative effects analysis area also extends along major roads, trails, and rivers where management inside the planning area could impact use outside the planning area boundary.

At the broadest level, the physical, social, and operational recreation character of BLM-administered lands along the urban interface is quickly changing from natural to more developed, from less crowded to more contacts with others, and from less restrictive to more rules and regulations. These changes will impact the recreational opportunities that can be offered and the recreation experience and benefit opportunities that can be produced by land managers and partners.

Past, present, and reasonably foreseeable future actions are identified on **Table 4-1**. Population growth and growth of urban interface areas have and will increase demands for access on BLM-administered lands and demands for undeveloped dispersed recreation, including OHV use. Forest plans for nearby National Forest System lands and RMPs for adjacent BLM-administered lands have or are closing areas and routes to motorized recreation, causing users to move to BLM-administered lands in the planning area.

Increasing urban and suburban populations proximate to the planning area have greatly increased the level of recreational use on BLM-administered lands. There is a strong correlation between population growth, visitation, and recreation in large part because many new residents have moved to the area specifically because of easy access to recreation opportunities on BLM-administered lands. The expanding suburban development footprint has also placed many new neighborhoods directly next to BLM boundaries, resulting in increased trespass onto private property and resource impacts from private property owners accessing public lands from adjoining private land (e.g., social trailing).

Management of vegetation, wildlife, special status species, and wild horses and burros that implement strategies to protect or rehabilitate areas would also serve to maintain recreational experiences but could also restrict recreation access. Cumulative impacts would vary by the degree of protective management and use restrictions proposed by alternative. Management of areas with special

designations such as ACECs, WSR, or WSAs would reduce potential access for some recreationalist while providing positive recreational experiences to those seeking solitude. Increased oil, gas, and locatable and salable mineral exploration and development have altered physical settings through the construction of well pads, roads, and related infrastructure. As a result, many areas have trended away from a more natural setting and users seeking a back-country or primitive experience have been displaced. While the eastern portion of the planning area remains relatively undeveloped, high demand for oil and gas extraction could change the setting in many locations over the life of the plan.

4.4.5 Comprehensive Travel and Transportation

Because CTTM goals, objectives, and actions are largely carried out in response to the desired management of other uses and resource programs, effects from CTTM are analyzed in the appropriate resource section. For example, management actions that close or limit areas to OHV travel typically benefit soil resources. Effects of OHV management on soil resources are therefore analyzed in **Section 4.3.3, Soil Resources**. The same closures or limitations would decrease recreational OHV opportunities. Accordingly, impacts from CTTM on recreation are discussed in **Section 4.4.4, Recreation and Visitor Services**. Only those impacts resulting from actions that affect access within the study area are discussed in this section.

Summary

Impacts on CTTM are the result of changes to the management of the transportation network that change the level of access. Management that restricts travel (e.g., OHV use) reduces access for those uses. Management that expands or limits the potential for an expanded travel network (e.g., ROW restrictions) would also affect CTTM. In general, management under Alternatives A, B, D, and E include less closed areas and fewer restrictions on motorized travel. Of these, Alternative A would affect CTTM the least. Effects on CTTM would be greatest under Alternative C, which would close the largest portion of the planning area to motorized travel and result in the most restrictions on access.

Methods of Analysis

Methods and Assumptions

The following methods and assumptions were used to assess the impacts on CTTM:

- The nature and types of potential impacts on CTTM from proposed actions under each alternative are based on:
 1. Numerical data gathered during the planning process
 2. BLM interdisciplinary team knowledge of the resource
 3. Input provided during the public scoping process

Where possible, this analysis uses quantitative data to describe impacts on CTTM from other resources and resource use programs. Qualitative information is also used to support quantitatively-based analysis or where numerical data does not exist. In all cases, best professional judgment is used in evaluating effects on the CTTM program.

- Demand for motorized, non-motorized, and mechanized travel on BLM-administered lands will continue to increase throughout the life of the plan.
- The potential for resource and user conflict increases as use increases and becomes more concentrated.
- Impacts on travel management result from limitations, such as wildlife stipulations, special designations, and cultural resources, as well as permitted uses, such as ROW development, livestock grazing, and mining.
- Management actions that limit new development (e.g. lands and realty ROW exclusion criteria) subsequently restrict expansion of the travel network by restricting uses that require new route construction.
- The travel designations will not affect ROW holders, permitted uses, county or state roads, or other valid existing rights. Travel closures/limitations apply only to public access.

A travel management plan with specific route designations will be developed as part of a subsequent implementation-level planning process and is not included as part of this RMP/EIS.

- Implementation of a travel management plan would include increased public education, signing, enforcement, and resource monitoring in regard to travel management.

Indicators

The following indicators were used to assess impacts on CTTM:

- Areas designated as open, limited, or closed to motorized and/or mechanized travel
- Management actions that would limit the BLM's ability to maintain or enhance the travel network

Nature and Type of Effects

Impacts on CTTM are those that restrict or enhance the use of and access to the travel network, primarily through the management of areas as open, closed or limited to motorized or mechanized travel. For example, management actions that limit motorized travel to existing routes would restrict motorized cross-country travel opportunities. At the same time, a limited designation may

benefit mechanized and non-motorized travel in the previously open areas by reducing encounters with motorized vehicles. The area designation would also focus management attention on the existing route network and on providing quality access via those routes, thereby improving management efficiency. Areas open to motorized and/or mechanized travel would allow for cross-country travel, which would result in the least restriction on CTTM, but the greatest conflict with other resources and uses.

CTTM area designations (i.e., open, closed, or limited) can impact access and the travel network by improving or degrading access for certain types of uses and by reducing or increasing the opportunities for conflict or congestion. In areas where CTTM closures only apply to motorized travel, the closure would restrict motorized vehicle access but potentially reduce conflicts and improve accessibility for non-motorized modes. Full closure to motorized and mechanized travel would decrease access for those travel modes, while potentially reducing conflicts for pedestrian, equestrian, and other non-motorized or mechanized modes of travel.

Management of other resources can affect CTTM through actions that restrict the development or improvement of roads, trails, and other routes (e.g., via the establishment of ROW avoidance or exclusion areas) or through actions that change the quantity of BLM-administered lands in the planning area. ROW exclusion and avoidance criteria decrease accessibility by reducing the potential for future access in restricted areas. Land acquisitions can add land to the Public Lands System, providing greater public access. Disposals transfer ownership from BLM to another entity which could change the nature and type of travel opportunities on those lands. Because effects from restrictions on development are primarily the result of land use allocations (e.g., ROW avoidance and exclusion areas) under lands and realty, effects are discussed under that section only and not under other resource areas, even though the protection of the resource may be dictating the ROW allocation.

During subsequent implementation-level travel management planning, specific route closures, seasonal restrictions, or other travel-related restrictions could occur in order to protect sensitive resources (e.g., cultural, paleontological, vegetation, or wildlife) or minimize conflict with resource uses. However, implementing land use plan-level management for the following resources and resource uses would have negligible or no effect on CTTM and are therefore not discussed in detail: air quality, climate change, cultural resources, wild horses and burros, wildland fire and ecology, paleontological resources, forestry and woodland product management, WSRs, back country wildlife conservation areas, tribal interests, socioeconomic conditions, environmental justice, and facilities and transportation maintenance.

CTTM: Effects from Soil Resources

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Soil resources management under Alternative A would include implementing site-specific road or route use restrictions in order to reduce resource damage. Impacts are expected to be short term and limited to specific areas.

Effects under Alternative B

Management under Alternative B would avoid surface disturbing activities (e.g., construction of new roadways) on slopes greater than 30 percent, or where not feasible, require an erosion control plan to maintain soil stability. These avoidance criteria would limit road construction or potentially increase road construction disturbance to avoid steep slopes, increasing costs.

Effects under Alternative C

Effects on CTTM under Alternative C would be similar to Alternative B, with the exception that effects from avoidance criteria would apply to slopes greater than 21 percent. This would result in a larger area where motorized travel would potentially be restricted.

Effects under Alternative D

Impacts on CTTM from soil resources management under Alternative D would be the same as those described under Alternative C.

Effects under Alternative E

Impacts on CTTM from soil resources management under Alternative E would be the same as those described under Alternative C.

CTTM: Effects from Water Resources

Effects under Alternative A

Alternative A would continue to restrict motorized access in riparian areas, stream channels, and through or near surface water sources where such use would degrade the quality or quantity of the water body. This would continue to result in a long-term loss of motorized travel opportunities in these areas. However, a lack of specific and up-to-date management actions under Alternative A would result in few if any additional future restrictions on travel access with negligible or no additional impacts on CTTM.

Effects under Alternatives B, C, D, and E

Because there are no proposed actions that would restrict travel, water resources management under Alternatives B through E would have no effect on CTTM.

CTTM: Effects from Vegetation Resources

Effects under Alternative A, B, D, and E

Because there are no actions that would limit or enhance access, vegetation resources management under Alternatives A, B, D, and E would continue to have no effect on CTTM.

Effects under Alternative C

BLM management for vegetation resources under Alternative C would limit new stream crossings, restrict the development of new travel routes, and relocate existing routes within 500 feet of sensitive riparian and wetland areas. Removing travel routes and preventing new construction would decrease access for motorized, mechanized, and non-motorized or mechanized travel in those areas. Effects from restrictions on stream crossings would be the same as Alternative B.

CTTM: Effects from Fish and Wildlife Management

Effects under Alternative A

Alternative A would continue to restrict motorized travel to designated routes in the Swan Lake Study area. However, because all forms of travel could continue on those designated routes, there would be little to no impact on access in that area. In the remainder of the planning area, management for fish and wildlife under Alternative A would continue to neither limit nor enhance access.

Effects under Alternative B, C, and E

Fish and wildlife management under Alternatives B, C, and E would not impact travel-related access and would, therefore, have no impact on CTTM.

Effects under Alternative D

Installation of fences along roadways under Alternative D to prevent vehicle collisions in urban interface zones would conflict with travel activities where fences obstruct or prevent the movement of vehicles. In areas where OHV travel is limited to existing routes, fencing constructed along roadways would maintain or improve motorized travel by reducing wildlife collisions, but could obstruct non-motorized access to areas next to fenced roadways.

CTTM: Effects from Special Status Species Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Emergency OHV closures to protect identified threatened, endangered and BLM special status plant populations would continue to result in short-term, localized reductions in motorized travel access.

Effects under Alternative B

Removal of fences within 1.25 miles of active sage-grouse leks under Alternative B would improve access for cross-country mechanized, pedestrian, and equestrian travel.

Effects under Alternative C

Under Alternative C, seasonal prohibitions of motorized and mechanized travel within 4 miles of leks would eliminate those travel options within those areas between March 1 and May 15 and consolidate travel to fewer areas and routes in the decision area. Effects from the removal of fences would be the same as Alternative B, but would apply to a larger area (within 2 miles leks).

Effects under Alternative D

Effects from travel closures within 4-mile sage-grouse lek buffers would be the same as Alternative C, while effects from the removal of fences within 1.25 miles of active leks would be the same as Alternative B.

Effects under Alternative E

Under Alternative E, the effects from the removal of fences would be the same as Alternative B, but would apply to a larger area (1.8 miles surrounding leks).

CTTM: Effects from Visual Resources

Effects Common to All Alternatives

Under all alternatives, the BLM would manage resource and resource uses consistent with applicable VRM class objectives. Objectives for VRM Class I and II, which respectively specify preservation and retention of existing landscape characteristics, would have a greater likelihood of limiting OHV use and future access by restricting the location and/or applying mitigation measures to the development or expansion of new travel ways. Fewer restrictions would be likely in VRM Classes III and IV.

Effects under Alternative A

Alternative A would manage 13 percent (602,400 acres) of the planning area as VRM Class I or II. Where proposed travel way development would conflict with VRM objectives in these areas, the activity would likely be approved only if re-located or designed to minimize impacts on desired visual resource conditions.

Alternative A would manage the Burbank Canyons and Red Rocks as scenic areas with travel limited to designated routes. This would continue to limit OHV travel in those areas, particularly where existing routes are designated as closed to motorized travel.

Effects under Alternative B

Similar to Alternative A, management of 13 percent (620,900 acres) of the planning area as Class I or II would affect the location and types of new travel ways allowed in those areas. In addition to designating VRM Classes I and II,

Alternative B would provide VRM Class III and IV objectives for the remainder of the planning area (4,182,400 acres). Visual resource management objectives would support OHV use and new or expanded access within these areas, particularly within VRM Class IV areas.

Effects under Alternative C

Visual resources management under Alternative C would have the greatest potential to limit access by managing 36 percent (1,715,800 acres) of the planning area as VRM Class I or II. The *Nature and Types of Effects* on access in these areas would be the same as those described under Alternative B.

Effects under Alternative D

Effects on CTTM from visual resources management under Alternative D would be similar to Alternative B, but would promote greater access by managing 42 percent (1,183,900 acres) more land as VRM Class IV.

Effects under Alternative E

Effects on CTTM from Class I and II VRM objectives would be similar to Alternative C, but would manage more acres as VRM Class III.

CTTM: Effects from Caves and Cave Resources Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

There would continue to be no management actions that limit or enhance access and therefore no effects from caves and cave resource management on CTTM under Alternative A.

Effects under Alternatives B, D, and E

Development of public education and other outreach for Dynamite Cave under Alternatives B, D, and E intended to draw attention and increase visitation to the cave could increase congestion on routes in proximity to the cave.

Effects under Alternative C

Effects under Alternative C would be the same as Alternative B for non-motorized travel. However, to protect Dynamite and Hidden caves, the BLM would prohibit motorized travel access within 500 feet of the cave.

CTTM: Effects from Livestock Grazing Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Livestock grazing management under Alternative A could continue to directly affect CTTM where new routes are established for livestock grazing management. New routes would increase overall route density on BLM-administered lands, thereby expanding the route network.

Effects under Alternative B

Effects from Livestock Grazing Management on CTTM under Alternative B would be the same as Alternative A.

Effects under Alternative C

Alternative C would reduce the number of acres available for livestock grazing by 56 percent (2,101,300 acres) compared to Alternative A. Less livestock grazing would decrease the potential for new routes. Less travel on existing routes in previously open allotments would reduce the need to maintain those routes. If not maintained, routes in closed areas may become impassible over time for certain vehicle types.

Effects under Alternative D

Effects from Livestock Grazing Management on CTTM under Alternative D would be the same as Alternative A.

Effects under Alternative E

Effects from Livestock Grazing Management on CTTM under Alternative E would be the same as Alternative A.

CTTM: Effects from Geology and Mineral Management

Effects Common to All Alternatives

New routes associated with mineral development could temporarily expand the route network and provide more travel opportunities. However, in the long-term, routes associated with mineral development are often reclaimed. Restrictions on mineral material disposal would have localized short- and long-term impacts on CTTM where closures limit the availability of gravel to maintain road surfaces.

Effects under Alternative A

Under Alternative A, areas managed as closed to mineral development (839,100 acres) would continue to have little or no likelihood for new route development.

Effects under Alternative B

The nature of effects from Geology and Mineral Management on CTTM under Alternative B would be similar to Alternative A. Additional NSO stipulations for fluid minerals (404,600 acres) would reduce the potential for new routes in those areas.

Effects under Alternative C

Alternative C could result in a less extensive and well-maintained travel network compared to Alternative A by placing more restrictions on all types of mineral development, closing an additional 3,004,800 acres to mineral material disposal, and closing existing aggregate facilities that are incompatible with wildlife, cultural, or special designations management objectives. Allowing for temporary aggregate facilities for government access only would enable ongoing road maintenance and could offset impacts from permanent mineral material closures elsewhere.

Effects under Alternative D

The nature of effects from Geology and Mineral Management on CTTM under Alternative D would be similar to Alternative A. Additional NSO stipulations for fluid minerals (864,800 acres) would reduce the potential for new routes in those areas; however, because less areas would be closed to fluid mineral leasing there would be greater potential for new routes to access fluid mineral development sites.

Effects under Alternative E

Alternative E could result in a less extensive and well-maintained travel network compared to Alternative A by restricting mineral development, closing an additional 1,778,700 acres to mineral material disposal, and closing existing aggregate facilities that are incompatible with adjacent land uses. Temporary aggregate facilities for government access only would allow for ongoing road maintenance and could offset impacts from permanent mineral material closures elsewhere.

CTTM: Effects from Recreation and Visitor Services

Effects Common to All Alternatives

Under all alternatives, the BLM would seek to acquire easements to provide access to BLM-administered lands to meet recreation objectives. These easements would expand and improve the travel network while reducing barriers to access.

Effects under Alternative A

Alternative A specifies the construction of an interpretive trail in the Jumbo Postpile area and would maintain the 2-wheel road system in Bedell Flat and Dry Valley areas. Expansion of the trail network would expand non-motorized travel options such as pedestrian, equestrian, and cycling, while maintenance of the existing road network would preserve access in those areas.

Effects under Alternatives B, C, D, and E

Under Alternatives B through E, the BLM would manage a collection of SRMAs and ERMAs to provide and protect specific recreational opportunities and setting characteristics. Management includes objectives and actions for motorized and non-motorized travel. Effects of these management actions on

recreation are analyzed in **Section 4.4.4**, Recreation and Visitor Services. Effects on CTTM from OHV management and other travel management actions within SRMAs and ERMAs are discussed below under *CTTM: Effects from CTTM*.

CTTM: Effects from CTTM

Effects Common to All Alternatives

In addition to establishing OHV area designations under all alternatives, the BLM would also carry out an implementation-level travel management planning process to designate the types of travel allowed on individual routes within the planning area. As part of travel management planning, the BLM would inventory all existing routes and assign specific management to those routes. This process allows the BLM to more effectively manage travel within the planning area, ultimately reducing conflict with other resources and uses, including conflict among various travel modes.

Effects under Alternative A

Alternative A would continue to manage 3,840,300 acres as open to cross-country travel, would provide the greatest opportunity for cross-country OHV and mechanized travel. Of the remaining portion of the planning area, the BLM would designate 924,300 acres as limited to existing routes for motorized and mechanized travel, while 6,900 acres would be closed to motorized and mechanized travel and 31,800 acres would be closed to motorized travel with mechanized travel allowed on existing routes. Designating 3,840,300 acres of the planning area as open to all forms of travel would enable the most extensive access to BLM-administered lands. However, the continual creation of new linear travel features decreases the BLM's ability to provide comprehensive travel management planning on the existing route network. The BLM would not establish travel management areas under Alternative A to support specific resource management decisions and address public needs; accordingly, conflicts among the various types of travel modes would be greatest under Alternative A.

Effects under Alternative B

Alternative B would designate 95,300 acres as open to cross-country travel, reducing the amount of land available for cross-country OHV travel by 3,745,000 acres compared to Alternative A. Under Alternative B, there would be 2,600 fewer acres closed to motorized and mechanized travel than Alternative A and 1,400 fewer acres closed to motorized travel. For the large majority of the planning area (4,677,000 acres) under Alternative B, motorized and mechanized travel would be limited to existing roads, primitive roads, and trails.

Although more restrictive than Alternative A, compared with the other action alternatives (Alternatives C, D, and E), Alternative B would maintain the largest area for cross-country OHV and mechanized travel.

Alternative B would require seasonal routes closures in specified areas to protect sensitive wildlife (e.g., mule deer and raptors) and to minimize conflicts with the Reno Air Races. During the time period when these seasonal closures apply, motorized access to routes in the closed areas would be restricted; mechanized and other non-motorized travel would be unaffected.

Management under Alternative B would reduce or eliminate the creation of new linear travel features and concentrate BLM CTTM planning on existing routes. In addition, the BLM would establish 16 travel management areas where managed would be focused on improving transportation access and minimizing conflicts among users.

Effects under Alternative C

Under Alternative C, the BLM would place the most restrictions on travel management and provide the least overall access to BLM-administered lands in the planning area. Compared to Alternative A, management under Alternative C would increase the areas closed to motorized and mechanized travel by 591,100 acres and the area closed to motorized travel by 1,158,700 acres. In total, closed areas under Alternative C would account for 37 percent (3,612,700 acres) of the planning area. All WSAs would be closed to motorized travel.

Less than one percent (1,300 acres) would be open to cross-country motorized and mechanized travel. While the majority of the planning area (63 percent) would be managed as limited to existing roads, primitive roads, and trails (2,089,200 acres more than Alternative A), this area would be much less than the other action alternatives.

Alternative C would also require more seasonal route closures than the other alternatives. Closures would be implemented in ACECs to protect sensitive wildlife (e.g., mule deer and raptors) and to minimize conflicts with the Reno Air Races. During the time period when these seasonal closures apply, motorized access to routes in the closed areas would be restricted. Mechanized travel would be limited to existing routes.

The result of management actions under Alternative C would be less overall access for motorized and mechanized travel than the other alternatives and the possibility for more congestion on routes outside closed areas. OHV closures in SRMAs and ERMAAs would impact recreation opportunities in those areas but also redistribute recreational OHV users to other areas for those activities. This would increase the potential for congestion and conflict with non-motorized users elsewhere in the planning area.

Benefits under Alternative C from the establishment of travel management areas would be the same as Alternative B.

Effects under Alternative D

Effects on CTTM under Alternative D would be similar to Alternative B, with the major exception being that there would be 76 percent less area (72,600 71,400 acres) available under Alternative D for cross-country motorized and mechanized travel. Alternative D would designate 2 percent more area (71,400 acres) as limited compared to Alternative B.

Compared to Alternative A, management under Alternative D would largely re-designate three-quarters of the planning area from an open designation to a designation of limited to existing roads, primitive roads, and trails.

Alternative D would reduce or eliminate the creation of new linear travel features and focus BLM CTTM planning efforts on the existing route network. The BLM would establish 9 travel management areas with similar benefits as described under Alternative B.

Impacts on CTTM from seasonal closures under Alternative D would be the same as Alternative B.

Effects under Alternative E

Effects on CTTM under Alternative E would be similar to Alternatives B and D. Alternative E would designate 150 percent more areas as open to cross-country motorized and mechanized travel than Alternative D, but 42 percent less than Alternative B. Similarly, Alternative E would designate more area as limited compared to Alternative B, but less area than Alternative D.

Effects from seasonal closures under Alternative E would be similar to Alternative B, except that access via mechanized travel modes would be limited to existing routes in seasonally closed areas and seasonal closures would also apply to the Petersen ERMA and Sand Mountain SRMA.

Similar to Alternatives B through D, Alternative E would reduce or eliminate the creation of new linear travel features and focus BLM CTTM planning efforts on the existing route network. The BLM would establish 10 travel management areas with similar benefits as those described under Alternative B.

CTTM: Effects from Lands and Realty

Effects Common to All Alternatives

Under all alternatives, CTTM would benefit from land tenure adjustments that increase access to BLM-administered lands. Utility corridors would continue to be the preferred locations for future linear ROW development, such as electrical transmission lines and pipelines. Corresponding expansions to the existing travel network would be expected in these areas.

Effects under Alternative A

Manage under Alternative A that prioritizes access to the Pah Rah Range, Petersen Mountains, and the Jumbo area while maintaining or increasing access to other BLM-administered lands would continue to benefit CTTM by improving overall access to the travel network. However, the lack of specific and up-to-date management actions under Alternative A would reduce the likelihood of realizing these benefits.

Under Alternative A, 179,700 acres of lands would be identified for disposal and 564,100 acres managed as ROW exclusion areas. Impacts from land disposal and ROW restrictions would reduce long-term access consistent with the description under *Nature and Types of Effects*.

Effects under Alternative B

Alternative B would identify 273,500 acres for disposal, more than Alternative A. The BLM would manage 580,000 acres as ROW exclusion and 1,195,800 acres as ROW avoidance areas. Impacts associated with reductions in long-term access from land disposal and ROW restrictions would be consistent with the description under *Nature and Types of Effects*.

Effects under Alternative C

Alternative C would have the least potential for impacts from land tenure actions because there would not be any areas identified for disposal. Alternative C would manage 2,675,800 acres as ROW exclusion areas and 369,300 acres as ROW avoidance areas, placing the most restrictions on future ROW development. Impacts associated with reductions in long-term access from ROW restrictions would be consistent with those described under *Nature and Types of Effects*.

Effects under Alternative D

Land tenure actions under Alternative D would have the greatest potential for reducing access to and across BLM-administered lands by identifying the most area for disposal of any alternative (332,500 acres) and making eligible for transfer to the BIA an additional 31,900 acres.

Because the same number of acres would be managed as ROW exclusion, effects on CTTM from ROW exclusions would be the same as Alternative A. Managing 1,226,1000 acres as ROW avoidance would have minimal effects on CTTM. Impacts associated with ROW restrictions would be consistent with the description under *Nature and Types of Effects*.

Effects under Alternative E

Effects on CTTM from land tenure actions under Alternative E would be similar to Alternative D, but would include 65,300 fewer acres identified for disposal.

Future expansion of the travel network would be restricted in 605,900 acres of ROW exclusion areas and 1,448,200 acres of ROW avoidance areas, which together account for percent of BLM administered land in the planning area.

CTTM: Effects from Renewable Energy

Effects Common to All Alternatives

Under all alternatives, national and state policies will continue to prioritize renewable energy development on BLM-administered lands. New or expanded wind and solar energy development increases the potential for new travel routes or upgrading of existing routes. These routes would benefit CTTM by providing additional access to and across BLM-administered lands. Renewable energy projects could also add vehicles to the travel network, especially during construction, with the result of added congestion and decreased access for other travel network users.

Effects under Alternative A

Alternative A would establish the fewest restrictions on wind and solar energy development and would therefore offer the greatest opportunity for an expanded route network. Alternative A would also result in the greatest potential for congestion on existing routes if new routes are not constructed to support renewable energy projects.

Effects under Alternative B

Alternative B would manage for a smaller solar variance area than Alternative A and would manage 1,220,200 acres as ROW avoidance for wind. However, of the action alternatives (Alternatives B, C, and D), Alternative B would provide the greatest opportunity for an expanded network of travel routes.

Effects under Alternative C

Alternative C would manage the fewest acres of solar variance area and most acres as wind ROW exclusion area, resulting in the fewest opportunities to expand the travel route network. Alternative C would also result in the least opportunity for added congestion from traffic associated with renewable energy projects.

Effects under Alternative D

Management of renewable energy under Alternative D would be similar to Alternative B, but with less potential for beneficial effects on CTTM due to a smaller solar variance area and larger ROW avoidance areas.

Effects under Alternative E

Management of renewable energy under Alternative E would be similar to Alternatives B and D, but with less potential for new travel routes than those alternatives due to a smaller solar variance area and larger ROW avoidance areas.

CTTM: Effects from Areas of Critical Environmental Concern

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

To preserve and protect their relevant and important values, management under Alternative A would continue to restrict OHV use on 21,800 acres in the following ACECs: Carson Wandering Skipper ACEC, Incandescent Rocks Scenic ACEC, Pah Rah High Basin Petroglyph ACEC, Steamboat Hot Springs Geyser Basin ACEC, Stewart Valley Paleontological ACEC, and Virginia Range Williams Combleaf Botanical ACEC. ACEC management would not affect access or travel opportunities throughout the remainder of the planning area.

Effects under Alternative B

Although Alternative B would manage for more ACECs than Alternative A, only the Grimes Point Archaeological District ACEC (15,900 acres) would include specific management to restrict access for OHV travel, resulting in a smaller area where motorized access would be limited.

Effects under Alternative C

Alternative C would result in the greatest impact on the travel network by closing or restricting areas to motorized and mechanized travel. The following ACECs, which together account for 786,270 acres, would include specific CTTM restrictions for motorized and/or mechanized travel: Churchill Narrow Buckwheat Botanical ACEC, Clan Alpine Greater Sage-Grouse ACEC, Carson Wandering Skipper ACEC, Dixie Valley Toad ACEC, Fox Peak Cultural ACEC, Grimes Point Archaeological District ACEC, Lassen Red Rock Scenic ACEC, Namazii Wunu Cultural ACEC, Pah Rah High Basin Petroglyph ACEC, Pine Nut Bi-state Sage Grouse ACEC, Pine Nut Mountains Williams Combleaf Botanical ACEC, Ruhenstroth Paleontological ACEC, Greater Sand Mountain ACEC (seasonal), Sand Spring Desert Study Area ACEC, Steamboat Buckwheat Botanical ACEC, Tagim aša Cultural ACEC, Virginia Mountains Greater Sage-Grouse ACEC, and Virginia Range Williams Combleaf Botanical ACEC.

Effects under Alternatives D and E

None of the ACECs proposed under Alternatives D or E would include travel restrictions. Accordingly, access would be improved over current conditions and there would be no adverse impacts on CTTM from ACECs under these alternatives.

CTTM: Effects from Back Country Byways

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Continued management of the Fort Churchill to Wellington BLM Back Country Byway under Alternative A would maintain paved and un-paved access for passenger vehicles and other travel modes along the 33-mile route.

Effects under Alternative B

Management of the Fort Churchill, Marietta, and New Pass to Hawthorne Back Country Byways under Alternative B would maintain or enhance access within the planning area. However, designation of previously existing routes as Back Country Byways could increase vehicle traffic, create congestion along the route, and more rapidly degrade the quality of the road surface. Availability of federal funding to maintain Back Country Byways would offset impacts from increased usage.

Effects under Alternative C

Rescission of the Fort Churchill Back Country Byway under Alternative C could improve access along that route by reducing congestion; however, no Back Country Byway-related funding would be available to maintain the roadway. Establishment of the Marietta and New Pass to Hawthorne Back Country Byways would have the same effects on CTTM as Alternative B.

Effects under Alternative D

Rescission of the Fort Churchill Back Country Byway under Alternative D would have the same effects on CTTM as Alternative C. Because Alternative D would not designate the Marietta or New Pass to Hawthorne Back Country Byways, effects on CTTM for those areas would be the same as Alternative A.

Effects under Alternative E

Effects on CTTM from Back Country Byways would be the same as Alternative B.

CTTM: Effects from National Trails

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would maintain current designations for the California and Pony Express National Historic Trails and the Grimes Point National Recreation Trail. The BLM would continue to provide non-motorized pedestrian access along the trail routes. However, a lack of specific and up-to-date management actions under Alternative A for these trails would limit the BLM's ability to maintain or enhance access.

Effects under Alternatives B, C, D, and E

Under Alternatives B through E, BLM management would expand non-motorized access along the Mickey Canyon and Humboldt Sink to Dayton

segments of the California NHT and the Grimes Point NRT. Pedestrian and other non-motorized access along the Pony Express NHT could be diminished by removal of the NHT designation.

CTTM: Effects from Wilderness Study Areas

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternatives A, B, D, and E

While Alternative A would continue to limit motorized travel to existing ways in WSAs, such a designation would result in little to no restrictions on overall access in the planning area and therefore no impact on CTTM.

Effects under Alternative C

WSAs under Alternative C would be closed to motorized and mechanized travel, thereby prohibiting access in those areas for all but pedestrian, equestrian, and other non-motorized and non-mechanized modes.

CTTM: Effects from Public Health and Safety

Effects Common to All Alternatives

Under all alternatives, BLM management would protect public health and safety by prohibiting all forms of public access on 340 acres in the Harvey's Place area. The closure would continue to be localized and have negligible effects on the BLM's overall CTTM program.

Effects Common to All Alternatives

There are no effects common to all alternatives.

CTTM: Effects from Interpretation and Environmental Education

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

There would continue to be no Interpretation and Environmental Education management actions under Alternative A that promote or discourage access and therefore no effects Education on CTTM.

Effects under Alternatives B, C, D, and E

Increased public education and interpretive opportunities under Alternatives B through E would increase the public's familiarity with the BLM travel network, including an understanding of and respect for area and route designations. Greater awareness of and purpose for BLM management would benefit CTTM by reducing the prevalence of unauthorized travel (e.g., cross-country travel in

limited designation areas) and minimizing conflict among route users, particularly in high-use areas.

CTTM: Cumulative Effects

Past, present, and reasonably foreseeable future actions (See **Table 4-1**) and conditions within the cumulative impact analysis area that have affected and will likely continue to affect comprehensive travel and transportation management are those that improve, maintain, or impeded users' access to existing roads and trails. The BLM has and presently manages 3,840,300 acres of the planning area as open to motorized travel, while limiting motorized travel to existing routes on another 924,300 acres and closing 6,900 acres to protect sensitive resource areas. Under all alternatives, the BLM would manage areas as open, closed, or limited to motorized travel. The acreages of these areas would vary by alternative with Alternative C resulting in the largest area (1,788,500 acres) being managed as closed to motorized travel. Alternatives B, D, and E would mostly limit motorized and mechanized travel to existing routes. Managing areas as closed to motorized and (where applicable) mechanized travel, decreases access to the travel network. Management actions that would protect or improve vegetation, habitat, and watershed resources would potentially restrict motorized travel and recreational access within WSAs, ACECs, priority wildlife areas, and watersheds. Impacts would vary by alternative

Under all alternatives, unauthorized cross-country motorized travel will continue to impact CTTM. Cumulative impacts from cross-country travel include the creation of new travel routes and the need for additional management, such as enforcement, signage, and education. Unauthorized travel could result in seasonal or permanent closures of areas or designated routes. The BLM would evaluate the need for area closures and designations of travel types to specific routes as part of an implementation-level travel management planning process.

Resource use actions that avoid or exclude new ROW development would also cumulatively affect CTTM by limiting or preventing expansions to the travel network to accommodate future demand. Particularly in urban interface areas, there could be a need to add additional roads. Managing areas as avoidance or exclusion for road ROWs could create congestion on existing routes and decrease overall access. Additional mineral, renewable energy, and other ROW development is also expected to contribute to the demand for new road ROWs.

4.4.6 Lands and Realty

Summary

Management actions that impact the lands and realty program are those that change the amount of BLM-administered lands or that increase or decrease the

BLM's ability to accommodate demand for new land use authorizations (e.g., ROWs and leases). Alternative A would have the least impact on the lands and realty program by allowing for the most new ROW development (see **Table 4-21**, Acres of ROW Avoidance and Exclusion by Alternative) and identifying fewer lands for disposal than any alternative but Alternative C. Greater restrictions on land use authorizations under Alternative B would impact lands and realty more than Alternative A. The identification of more lands for disposal under Alternative B could reduce the amount of BLM-administered lands compared to Alternative A, but land tenure adjustments can also increase management efficiency and benefit the lands and realty program. Alternative C would manage the largest portion of the planning area as ROW exclusion and would not designate any lands for disposal, resulting in the greatest restrictions on land uses and eliminate opportunities to dispose of lands that could be difficult to manage. Alternative D would impact lands and realty similarly to Alternative A, but would allow for more lands disposal and would result in more limitations on land use authorizations by managing a small (2 percent) part of the planning area within a ROW avoidance area. Land disposals would be most likely to occur under Alternative E; however, management of one third of the planning area as ROW avoidance or exclusion criteria could diminish the BLM's ability to meet future ROW demand in those areas.

Table 4-21
Acres of ROW Avoidance and Exclusion by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
ROW Avoidance	0	1,195,800	369,300	1,226,100	1,448,200
ROW Exclusion	564,100	580,000	2,675,800	564,100	605,900

Source: BLM 2014

Methods of Analysis

Methods and Assumptions

The following methods and assumptions were used to assess the impacts on lands and realty:

- The nature and types of potential impacts on lands and realty from proposed actions under each alternative are based on:
 1. Numerical data gathered during the planning process
 2. BLM interdisciplinary team knowledge of the resource
 3. Input provided during the public scoping process

Where possible, this analysis uses quantitative data to describe impacts on lands and realty from other resources and resource use programs. Qualitative information is also used to support

quantitatively-based analysis or where numerical data does not exist. In all cases, best professional judgment is used in evaluating effects on the lands and realty program.

- Land acquisition by the BLM ensures the effective administration of BLM lands and serves the public interest by consolidating land patterns, improving resource management, maintaining access to BLM-administered lands, and supporting community development on adjacent non-BLM administered lands.
- Disposal of BLM-administered lands improves the effectiveness of BLM land management when disposed lands have little or no resource value and disposal would consolidate land patterns, improvement resource management on retained lands, and allow for community and/or agricultural development on adjacent non-BLM administered lands.
- All land not specifically identified for disposal is classified for retention.
- Retaining access to BLM-administered lands for public use and administrative purposes will continue to be a priority of the lands and realty program.
- Trespass limits the effectiveness of BLM land management, but must be addressed on a case-by-case basis to resolve properly.
- The BLM will continue to periodically review existing withdrawals and may recommend revocation of certain withdrawals consistent with the FLPMA. Any recommendation to revoke withdrawal lands should be for the purpose of protecting resources while minimizing impacts on public use.
- To ensure consistent management, the BLM will manage revoked, relinquished, or expired withdrawal lands in a manner consistent with adjacent or nearby lands.
- Where not specifically excluded, the BLM will continue to review and authorize land uses that meet the public need. Specific mitigation criteria such as collocation and low-impact design techniques can minimize adverse impacts on other resources.
- All future utility corridor and ROW proposals on BLM administered lands will be consistent with Regional and County Master Plans, Nevada State Statutes, and the Westwide Energy Corridor Programmatic EIS (including settlement agreement).
- Stipulations may be applied for ROW approval at the project level and are outlined in **Appendix I**, Land and Realty Authorizations Right-of-Way Stipulations.

Indicators

The following indicators were used to assess the degree of impacts on lands and realty in the planning area:

- Acres of BLM-administered lands identified for acquisition, retention, or disposal.
- Acres affected by land withdrawals.
- Acres of BLM-administered surface ownership affected by ROW restrictions (i.e., avoidance or exclusion areas).

Nature and Type of Effects

Effects on the lands and realty program result from land tenure actions that change the land ownership pattern or land authorization actions that affect the number and types of allowable uses. Land tenure actions such as disposal, acquisition, or exchange that create more contiguous areas of BLM-administered lands improve the efficiency of BLM management. Land authorization actions allowing the placement of new ROWs and leases maintain the BLM's ability to accommodate new development such as roads, electrical transmission infrastructure, and communication sites.

Land acquisitions allow the BLM to acquire lands to protect sensitive resources, maintain public values, and improve overall resource management. Land acquisitions improve management efficiency when the acquired lands result in a more consolidated land use pattern and are easily accessible. Lands acquired to protect or improve resource values, such as threatened, endangered, or BLM-sensitive species habitat; riparian areas; wetlands; recreation areas; visually sensitive areas; and cultural resource sites, but that do not result in a more contiguous land pattern can result in decrease management efficiency and increased management costs. Retention of noncontiguous parcels also complicates access, decreases BLM management efficiency, and increases management costs.

Similar to acquisitions, land disposal can result in more contiguous land ownership patterns and increase BLM management efficiency. The BLM lands and realty program would be impacted by disposals that do not consolidate land ownership, do not maintain access to other BLM-administered lands, or decrease the BLM's ability to carry out its multiple-use mandate under the FLPMA.

Restrictions on land use authorizations, such as ROW exclusion and avoidance areas, impact the BLM lands and realty program by limiting or prohibiting use authorizations. A ROW exclusion area is one that is not available for a new ROW under any conditions. In ROW avoidance areas, ROW applications could be submitted, but a project proposed in these areas would be subject to additional requirements. Examples of the additional requirements are resource surveys and reports, construction and reclamation engineering, long-term

monitoring, special design features, special siting requirements, timing limitations, and rerouting. Such requirements could restrict project location, delay availability, limit future access, or increase the cost of energy supply or communications service availability (by delaying or restricting construction of pipelines, transmission lines, communication infrastructure, or renewable energy projects). As a result of special surveys and reports, alternative routes may need to be identified and selected.

Unless specific management is proposed for renewable energy ROWs, the management of areas as ROW exclusion and avoidance areas would decrease the BLM's ability to accommodate new wind and solar energy development. Impacts on industrial-scale solar energy development would be less than on wind due to lower solar energy potential in the planning area (NREL 2008).

Collocation of infrastructure in existing ROWs and disturbed areas reduces land use conflicts and additional land disturbance. Collocation policies also clarify the preferred locations for utilities and simplify processing on BLM-administered lands. However, collocating can limit development options. In addition, collocation may not always be feasible, such as in the situation where the safety clearances needed by previously constructed energy transmission infrastructure are such that no further room is available within the footprint of the existing ROW.

Resource management planning can involve closing areas to motorized travel. Area closures could make certain areas impractical for some types of land uses, such as transmission lines, where access is necessary to serve the land use.

BLM management actions such as limitation on surface disturbance and management as ROW exclusion areas for ACECs, National Historic Trails, and WSR segments would limit the nature and types of lands and realty actions allowed in those areas. Specific impacts include a decrease in the availability of BLM-administered lands for ROW development, leases, and certain temporary activities that may affect the unique resource values, historic or scenic properties, or outstanding and remarkable values, respectively, of those areas.

Proposed management for the following resources would have no impacts on lands and realty and are therefore not discussed in further detail below: air quality, wild horses and burros, wildland fire ecology and management, paleontological resources, forestry and woodland product management, Back Country Byways, public health and safety, and interpretation and education.

Lands and Realty: Effects from Climate Management

Effects Common to All Alternatives

Under all alternatives, national- and state-level policies would continue to promote the use of BLM-administered lands for low-carbon energy sources. Continued emphasis on wind, solar, geothermal and other renewable energy

sources would be expected to increase the number of ROW applications received.

Effects under Alternative A

There would continue to be no climate management under Alternative A and therefore no effects on the lands and realty program.

Effects under Alternative B

Management under Alternative E to reduce human-caused ecosystem stressors and promote habitat connectivity could result in some ROW application being modified or denied if they conflict with these objectives.

Effects under Alternative C

Effects under Alternative C would be similar to Alternative B, but could result in greater restrictions on certain ROWs, particularly in PPMAs.

Effects under Alternative D

Effects under Alternative C would be the same as Alternative B.

Effects under Alternative E

Effects under Alternative C would be the same as Alternative C.

Lands and Realty: Effects from Soil Resources

Effects Common to All Alternatives

Under all alternatives, BLM management would require that activities on sensitive soils develop BMPs or other mitigation measures to reduce impacts on those soils. As appropriate, BMPs and mitigation measures would be added requirements to ROW grants to reduce impacts.

Effects under Alternative A

Because the management of soil resources would not restrict or enhance the BLM's ability to meet lands and realty objectives, there would be no effects from soil resource management under Alternative A.

Effects under Alternative B

Alternative B would avoid new surface disturbing activities on slopes greater than 30 percent, reducing future feasibility of ROW development in those areas unless a project could develop an acceptable erosion control strategy.

Effects under Alternative C

Alternative C would avoid new surface disturbing activities on slopes between 21 percent and 39 percent, which would reduce the feasibility of ROW development in those areas. Surface disturbance would be prohibited on slopes greater than 40 percent. This would reduce or eliminate future ROW development in those areas unless the project could develop an acceptable erosion control strategy.

Effects under Alternative D

Effects on lands and realty from soil resources management under Alternative D would be the same as Alternative C.

Effects under Alternative E

Effects on lands and realty from soil resources management under Alternative E would be the same as Alternative C.

Lands and Realty: Effects from Water Resources

Effects Common to All Alternatives

For all alternatives, authorized uses would be required to comply with all applicable state water quality standards. Certain lands and realty objectives and/or actions could be supported or restricted by state water law.

Effects under Alternative A

Because the management of water resources would not restrict or enhance the BLM's ability to meet lands and realty objectives, there would be no effects under Alternative A.

Effects under Alternative B

Under Alternative B, the BLM would pursue the acquisition of lands to gain access to water resources. Effects from land tenure adjustments under Alternative B would be consistent with the *Nature and Types of Effects*.

Effects under Alternative C

Effects on land tenure from water resources under Alternative C would be the same as Alternative B. Alternative C would prohibit surface disturbing activities in source water protection zones. This would eliminate the potential for new ROW development in those areas.

Effects under Alternative D

Effects on land tenure from water resources under Alternative D would be the same as Alternative B. Alternative C would avoid surface disturbing activities in source water protection zones. This would reduce the potential for new ROW development in those areas.

Effects under Alternative E

Effects on the lands and realty program from the management of water resources under Alternative E would be the same as Alternative B.

Lands and Realty: Effects from Vegetation Resources

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

There would continue to be no vegetation resources management actions that would restrict or enhance the BLM's ability to meet lands and realty objectives under Alternative A, therefore there would be no effects under Alternative A.

Effects under Alternative B

Alternative B would prioritize the acquisition of riparian areas and other key surface water system areas. This would have effects similar to those described in the *Nature and Types of Effects* for land tenure adjustments.

Alternative B would decrease opportunities for new ROW development at stream crossings and potentially affect periodic review of ROWs by requiring existing ROW holders to develop weed management plans, inclusive of annual surveys. New travel-related ROWs would be avoided within and next to sensitive riparian or wetland areas.

Where riparian areas are in nonattainment status for PFC, requirements under Alternative B for fencing around riparian areas could increase the number of new ROW applications for fences in those areas.

Effects under Alternative C

Effects from the management of water resources on the lands and realty land tenure program would be similar to Alternative B and consistent with the *Nature and Types of Effects*.

Alternative C would affect the placement of new ROWs by excluding all types of ROWs within 200-feet of riparian and wetland areas, avoiding new travel-related ROWs within a minimum 500-foot buffer surrounding sensitive riparian or wetland areas, and precluding surface disturbance in floodplains and near springs or public water sources. Collectively, these restrictions would limit the BLM's ability to accommodate future demand for these types of ROWs.

Similar restrictions on mineral development near sensitive water resources would indirectly impact the lands and realty program by decreasing the demand for ROWs to serve new mineral development in these areas.

Effects from new fencing-related ROWs and requirements for weed management plans would be the same as Alternative B.

Effects under Alternative D

Effects from the management of water resources on the lands and realty land tenure program would be similar to Alternative B and consistent with the *Nature and Types of Effects*.

Alternative D would limit the placement of new ROWs by avoiding all types of ROWs within riparian and wetland areas and precluding surface disturbance within 200 feet of riparian and wetland areas and within 500 feet of springs.

Collectively, these restrictions would limit the BLM's ability to accommodate future ROW demand in these areas.

Direct effects from new fencing-related ROWs and requirements for weed management plans and indirect effects from restrictions on mineral development would be similar to, but slightly less restrictive than Alternative C.

Effects under Alternative E

Direct effects on lands and realty from vegetation resources management would be the same as Alternative B. Indirect effects from limitations on mineral development would be the same as Alternative C.

Lands and Realty: Effects from Fish and Wildlife Management

Effects Common to All Alternatives

Under all alternatives, BLM management for fish and wildlife would result in new or modified fencing ROW applications to allow for wildlife passage. New or modified ROW applications for water troughs for access by wildlife would also be expected. Where there is the potential for impacts on wildlife, development restrictions such as timing limitations and buffers could reduce the BLM's ability to accommodate new ROW demand in certain areas.

Effects under Alternative A

Because there would continue to be no fish and wildlife management actions that would restrict or promote lands and realty objectives, there would be no effects under Alternative A.

Effects under Alternative B

Alternative B would manage migratory waterfowl pathways, raptor nests, and bat habitats as ROW avoidance to protect fish and wildlife. This would affect future ROW development. Additional requirements to maintain habitat connectivity and mitigate disturbance from new surface disturbing activities could limit new ROWs, particularly linear ROWs such as transmission lines, pipelines, and roadways.

Current ROW holders would be required to add markings to fences, towers, and other vertical structures to prevent bird collisions. These requirements would impact the lands and realty program where the requirement would conflict with the terms and conditions of the existing ROW authorization.

Effects under Alternative C

Alternative C would prevent new fencing and exclude new ROWs within priority habitats and migratory waterfowl pathways or near raptor nests and bat habitats. This would result in the greatest impacts on future ROW development. Additional requirements to maintain habitat connectivity and mitigate disturbance from new surface disturbing activities would have effects similar to Alternative B.

Effects on current ROW holders from bird collision mitigation requirements would be the same as Alternative B.

Alternative C would indirectly impact lands and realty by placing NSO stipulations on fluid mineral development and prohibiting mineral material disposal and nonenergy leasing within proximity to migratory bird pathways and within 0.5 miles of raptor and bat nesting sites. Reduced fluid mineral development would reduce the demand for new road, pipeline, transmission line, and other ROWs typically needed to support mineral development.

Effects under Alternative D

Effects on lands and realty from fish and wildlife management under Alternative D would be similar to Alternative B, but would include the potential for additional ROW demand in the urban interface areas for fences or other structures to prevent vehicle collisions with wildlife.

Effects under Alternative E

Alternative E would limit future ROW development by avoiding new ROWs within big game habitats, migratory bird pathways and nesting sites, within 0.25 mile of bat habitats (0.5 mile for large scale ROWs), and by prohibiting new ROWs within 0.5 mile of raptor nest sites. Additional requirements to maintain habitat connectivity and mitigate disturbance from new surface disturbing activities would have effects similar to Alternative B.

Effects on current ROW holders from bird collision mitigation requirements would be the same as Alternative B.

Indirect impacts on lands and realty from restrictions on mineral development would be similar to Alternative C.

Lands and Realty: Effects from Special Status Species Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would require fencing to protect threatened or endangered plant populations. This could increase the demand for future fencing-related ROWs. Limits on land disposals in threatened or endangered plant species habitats would affect lands and realty where those limitations conflict with BLM land tenure objectives.

Effects under Alternative B

Alternative B would avoid ROW development in PPMA (275,600 acres). This would limit the potential for new ROW development in those areas. Prohibitions on structures 8 feet or taller within 1.8 miles of active lek sites would limit the placement of new electrical transmission lines, communication

towers, metrological towers, and other infrastructure in those buffer areas. Alternative B would also restrict new ROWs for fence construction and could require removal of existing fences within proximity of lek sites in PPMA. Timing restrictions for surface disturbing activities within PPMA could also make certain types of ROW development impractical or infeasible in Greater Sage-Grouse habitat.

Requirements under Alternative B to retain and acquire lands in PPMA would affect the lands and realty land tenure program where those limitations conflict with other BLM land tenure objectives.

Effects under Alternative C

Alternative C would result in the greatest impacts on the lands and realty program by managing PPMA and PGMA (414,200 acres) as ROW exclusions areas. Greater Sage-Grouse management would eliminate the potential for new ROW development on 414,200 acres of the planning area. Removing ROW opportunities in these areas could redistribute the demand for new ROWs to adjacent federal and non-federal lands throughout the planning area.

Prohibitions on tall structures and fences would have the same effects as Alternative B, but also apply to PGMA. Alternative B would also restrict new ROWs for fence construction and could require removal of existing fences within proximity of lek sites in PPMA. Timing restrictions for surface disturbing activities would have similar impacts as Alternative B, but would also apply to PGMA.

Requirements under Alternative B to retain and acquire lands in PPMA and PGMA would affect the lands and realty land tenure program where those limitations conflict with other BLM land tenure objectives.

Closure of PPMA and PGMA to fluid and nonenergy mineral leasing, mineral material disposal, and livestock grazing would indirectly affect lands and realty by reducing ROW demand (e.g., roads, transmission lines, pipelines, and water infrastructure) associated with those land uses.

Effects under Alternative D

Alternative D would manage PPMA and PGMA (414,200 acres) as ROW avoidance. This would decrease demand for new ROW in those areas but indirectly increase demand elsewhere in the planning area. Other direct effects on lands and realty from special status species management would be the same as Alternative B.

Application of an NSO stipulation for fluid mineral development under Alternative D would decrease the likelihood for new ROW applications associated with fluid mineral development.

Effects under Alternative E

Direct effects on lands and realty from special status species management under Alternative E would be the same as Alternative D. Indirect effects from restrictions on mineral development would be similar to Alternative C, but with the exception that NSO stipulations for fluid minerals under Alternative E could lead to minimal future ROW demand.

Lands and Realty: Effects from Cultural Resources Management*Effects Common to All Alternatives*

Under all alternatives, the BLM would seek to resolve conflicts with cultural resources from human-caused deterioration. Should a conflict involve an element of the lands and realty program, resolution of the conflict could affect the BLM's ability to meet certain lands and realty program objectives.

Effects under Alternative A

Cultural resources management actions would impact ROW proposals based on site-specific NEPA analysis and development of mitigation measures to protect cultural resources. Operations may be required to re-locate facilities to avoid cultural resources impacts increasing costs and project feasibility. Land tenure adjustments may not be allowed if sensitive cultural resources are present.

Effects under Alternative B

Management of cultural resources under Alternative B would result in localized reductions in new ROW development opportunities by managing a 0.25-mile buffer around historic trails and all historic properties, districts, landmarks, and TCPs as ROW avoidance areas. Avoiding ROW development in these areas could reduce overall demand or shift future ROWs to adjacent areas.

Effects under Alternative C

Alternative C would result in the greatest impacts on the lands and realty program by managing historic properties and districts, landmarks, and TCPs as ROW exclusion and a 2.5-mile buffer around historic trails as ROW avoidance. Restrictions or prohibitions on ROW development could reduce overall demand in restricted areas or shift future ROWs to adjacent areas.

Effects under Alternative D

Effects on lands and realty from cultural resources management under Alternative D would be the same as Alternative B.

Effects under Alternative E

Management of cultural resources under Alternative B would reduce ROW development opportunities by managing a 1 mile buffer around historic trails, the Virginia City National Historic Landmark and other historic properties, landmarks, districts, and TCPs, the 15,900 acre Wyemaha Archaeological District, and the 3,100-acre Pistone site as a ROW avoidance areas. Avoiding ROW development in these areas could reduce demand in the restricted areas

or shift future ROWs to adjacent areas. Limitations and closures for mineral development in these areas would further reduce the demand for new or expanded ROWs.

Lands and Realty: Effects from Visual Resources Management

Effects Common to All Alternatives

Under all alternatives, the BLM would manage resource and resource uses consistent with applicable VRM class objectives. Objectives for VRM Class I and II, which respectively specify preservation and retention of existing landscape characteristics, would have a greater likelihood of limiting the location and/or applying mitigation measures to ROWs and other land use authorizations. Fewer restrictions would be likely in VRM Classes III and IV.

Effects under Alternative A

Alternative A would continue to manage 602,400 acres of the planning area as VRM Class I or II. New ROW development, particularly those for high-visibility features such as transmission lines and roadways, would conflict with VRM objectives in these areas and likely be approved only if re-located or designed to minimize impacts on desired visual resource conditions.

Effects under Alternative B

Similar to Alternative A, managing 620,900 acres of the planning area as Class I or II would affect the location and types of land use authorizations allowed in those areas. In addition to designating VRM Classes I and II, Alternative B would provide VRM Class III and IV objectives for the remainder of the planning area (4,182,100 acres). Visual resource management objectives would support new or expanded ROW development within these areas, particularly within VRM Class IV areas.

Effects under Alternative C

Visual resources management under Alternative C would have the greatest potential to affect lands and realty by managing 1,715,800 acres of the planning area as VRM Class I or II. Effects on lands and realty in these areas would be the same as those described under Alternative A.

Effects under Alternative D

Effects from visual resources management under Alternative D would be similar to Alternative B, but would result in an increased potential for new ROWs by managing 3,986,900 acres as VRM Class IV.

Effects under Alternative E

Effects on lands and realty from Class I and II VRM objectives would be the similar to Alternative C, but would limit ROW development across (1,383,900 acres compared to Alternative C.

Lands and Realty: Effects from Caves and Cave Resources Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

There would continue to be no proposed actions that would restrict or promote lands and realty actions and therefore no effects from caves and cave resources management on lands and realty under Alternative A.

Effects under Alternative B

Management to protect Dynamite and Hidden caves would avoid ROW development within 0.25 miles of Dynamite Cave and 500 feet of Hidden Cave, subsequently limiting the BLM's ability to accommodate future ROW demand in those areas. Improved public education and other outreach for Dynamite Cave that would draw attention and increase visitation to the cave could increase future need for new road ROWs, thereby amplifying the effects from management as ROW avoidance.

Effects under Alternative C

Management to protect Dynamite and Hidden caves would prohibit ROW development within 0.5 miles of Dynamite Cave and 500 feet of Hidden Cave, subsequently eliminating the BLM's ability to accommodate future ROW demand in those areas. Improved public education and other outreach for Dynamite Cave that would draw attention and increase visitation to the cave could increase future need for new road ROWs thereby amplifying the effects of ROW exclusions.

Effects under Alternative D

Limitations on the BLM's ability to accommodate demand for future ROWs near caves and cave resources under Alternative D would lead to the same effects as Alternative B.

Effects under Alternative E

Prohibitions on the BLM's ability to accommodate demand for future ROWs near caves and cave resources under Alternative D would have the same effects as Alternative C.

Lands and Realty: Effects from Livestock Grazing Management

Effects Common to All Alternatives

Under all alternatives, livestock grazing management would promote the removal of retired grazing infrastructure, which could lead to the expiration of existing ROWs associated with that infrastructure.

Effects under Alternative A

Alternative A would continue to pursue land exchanges with the Southern Pacific Railroad and private owners to consolidate BLM-administered lands in the White Hills and Olinghouse allotments. This would improve the efficiency of the BLM lands and realty program where exchanges are successful. Livestock grazing would continue under current levels and be allowed throughout 99 percent (4,796,600 acres) of the planning area. Continued grazing levels would maintain the current demand for range infrastructure-related ROWs. Lands and realty actions would continue to be evaluated for compatibility with livestock grazing management.

Effects under Alternative B

Under Alternative B, 99 percent (4,797,200 acres) of the planning area would be available for livestock grazing and managed at existing use levels. This management would maintain the current demand for range infrastructure-related ROWs and need to evaluate lands and realty actions to minimize conflicts with livestock grazing management.

Effects under Alternative C

Alternative C would reduce the portion of the planning area available for livestock grazing to 2,101,300 acres and reduce AUMs by 110,500 acres. Fewer acres available for livestock grazing would reduce demand for range infrastructure-related ROWs and decrease the need to evaluate lands and realty actions for potential conflicts with livestock grazing management.

Effects under Alternative D

Effects from Livestock Grazing Management on lands and realty under Alternative D would be the similar to Alternative B.

Effects under Alternative E

Effects from Livestock Grazing Management on Lands and Realty under Alternative E would be the similar to Alternative B.

Lands and Realty: Effects from Geology and Mineral Management*Effects Common to All Alternatives*

There are no effects common to all alternatives.

Effects under Alternative A

Under Alternative A, demand for new ROWs to support mineral development would continue to affect the lands and realty program. The BLM would continue to recommend 3,700 acres for locatable mineral withdrawal and manage 839,100 acres as closed to fluid mineral leasing. Continued restrictions on mineral development in these areas would indirectly affect the lands and realty program by reducing the demand for roads, transmission lines, pipelines, and other ROWs normally required to support mineral development.

Effects under Alternative B

The nature of effects from Geology and Mineral Management on lands and realty under Alternative B would be similar to Alternative A. Additional NSO stipulations for fluid minerals (404,600 acres) would reduce the demand for new ROWs in those areas.

Effects under Alternative C

Alternative C would decrease ROW demand from mineral development more than any other alternative by placing the most restrictions on all types of mineral development. Compared to Alternative A, there would be 1,242,600 more acres closed and 1,038,500 more acres under NSO stipulations for fluid mineral leasing, over 2 million more acres closed to mineral materials, and over 2 million less acres open to nonenergy leasable minerals.

Effects under Alternative D

The nature of effects from Geology and Mineral Management on lands and realty under Alternative D would be similar to Alternative A. Additional NSO stipulations for fluid minerals (864,800 acres) would reduce the demand for new ROWs in those areas; however, because less areas would be closed to fluid mineral leasing there would be slightly greater demand for ROWs associated with fluid mineral development activities.

Effects under Alternative E

Compared to Alternative A, management under Alternative E would decrease ROW demand from mineral development by closing 168,100 acre) and applying NSO stipulations to 1,151,600 more acres for fluid mineral leasing, closing 1,214,500 more acres to mineral materials, and allowing nonenergy leasable mineral development on 1,047,100 less acres.

Lands and Realty: Effects from Recreation and Visitor Services*Effects Common to All Alternatives*

Under all alternatives, the BLM would continue to manage recreation and visitor services to minimize conflicts with other resources and resources uses. There would be little to no effects on the lands and realty program where proposed lands and realty actions would complement Recreation and Visitor Services management objectives. Where lands and realty actions have the potential to conflict with recreation objectives (e.g., within RMAs) resolution of these conflicts could affect the location, type, or extent of individual lands and realty decisions.

Effects under Alternatives A, B, C, and D

Under Alternatives A, B, C, and D, there would be no recreation and visitor services management actions that limit or increase demand for ROWs or affect land tenure and therefore no effects on lands and realty.

Effects under Alternative E

In all areas outside the Sand Mountain SRMA, effects from recreation and visitor services management on lands and realty would be the same as Alternative A. Within the Sand Mountain SRMA, new ROW authorizations would be restricted to existing ROW corridors and therefore limit, but not preclude, the placement of new ROWs in that area.

Lands and Realty: Effects from Comprehensive Travel and Transportation Management*Effects Common to All Alternatives*

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would continue to manage 80 percent (3,840,300 acres) of the planning area as open to cross-country motorized and mechanized travel with the majority of the remaining area limited to existing routes. While allowing unrestricted cross-country travel would provide unlimited access to ROW and lease locations for construction and maintenance activities, it also raises the potential for disruption or conflict with existing ROWs (e.g., pipelines and transmission lines) and lease sites (e.g., communication infrastructure).

CTTM management under Alternative A would also close 31,800 acres to motorized travel. Because opportunities for motorized access would be eliminated in these areas, there would be limited to no potential for new ROWs or leases.

Effects under Alternative B

Alternative B would limit motorized travel to existing roads and trails throughout 97 percent (4,677,000 acres) of the planning area. Limiting motorized travel to existing routes would maintain access opportunities for future ROWs and leases and therefore have little or no effect on lands and realty. Compared to Alternative A, Alternative B would manage 3,745,000 fewer acres (78 percent) as open to motorized and mechanized travel. This would decrease the potential for conflict with authorized land uses. CTTM management under Alternative B would close 7,700 fewer acres to motorized travel compared to Alternative A. This would maintain future ROW and lease demand in those areas.

Effects under Alternative C

Alternative C would manage the most areas (1,788,500 acres) as closed to motorized travel thereby restricting opportunities to access new ROWs in those areas. In all but 1,300 acres of the remaining portion of the planning area, travel would be limited to existing routes with benefits from reduced conflict similar to those described under Alternative A.

Effects under Alternative D

CTTM under Alternative D would have similar effects on lands and realty as Alternative B by limiting motorized travel to existing routes throughout 99 percent (4,748,400 acres) of the planning area, while closing less than one percent (32,200 acres) to motorized travel.

Effects under Alternative E

Alternative E would have the least effects on lands and realty from CTTM area closures by managing the smallest portion of the planning area (30,300 acres) as closed to motorized travel. Compared to Alternative A, CTTM under Alternative E would provide more opportunities to access to future ROWs. The nature and type of effects from managing 98 percent (4,717,300 acres) of the planning area as limited to existing routes would be the same as Alternative B. Seasonal closures to motorized travel.

Lands and Realty: Effects from Lands and Realty*Effects Common to All Alternatives*

Under all alternatives, the BLM would pursue land tenure adjustments that consolidate lands patterns, improve resource management efficiency, maintain community values, and support community development on adjacent private lands. When carried out in this fashion, land tenure adjustments benefit all resource programs and public use of BLM-administered lands. The BLM would also review withdrawals on a case-by-case basis with particular emphasis on revoking Reclamation Newlands lands. Revocation of Reclamation or other withdrawals would increase the BLM's land management obligations, but would have the potential to improve management efficiency.

As a means to minimize land disturbance from future infrastructure development, the BLM would continue to manage 440,000 acres of utility corridors and encourage their use for transmission lines 60kV or larger. Corridors can provide the BLM and public with greater certainty as to the location of future infrastructure, but could discourage future ROW development if development within the corridors is not practical.

Effects under Alternative A

Under Alternative A, the BLM would continue to pursue land use adjustments that would improve management efficiency or that would benefit other resource or resource use programs. Alternative A would continue to recommend 4 percent (179,700 acres) of the planning area for disposal. This would affect the lands and realty program as described in the *Nature and Types of Effects*.

Within 100-yr floodplains, Alternative A would manage all lands for retention. While retention could help preserve water resources it could reduce land management efficiency, especially if parcels are noncontiguous and/or better

managed by another entity. Limitations on new development in these areas would limit the potential for land use authorizations.

Additional land tenure actions under Alternative A would have the potential to improve management efficiency and reduce the potential for future conflicts by consolidating and acquiring lands in the Pine Nut Mountains and Jumbo allotments and disposing of lands near residential areas.

Alternative A would eliminate future ROW development potential on 12 percent (564,100 acres) of the planning area by managing those areas as ROW exclusion areas. While there would be no ROW avoidance areas, Alternative A would limit land use authorizations in high erosion susceptibility areas.

Requirements to collocate communication infrastructure within selected existing lease sites and preferred locations would limit opportunities to expand the communication network to cover additional areas outside current lease sites. However, collocation criteria would have the potential to streamline permitting of new communication infrastructure within existing sites.

Effects under Alternative B

Compared to Alternative A, management under Alternative B would prevent land tenure adjustments that result in a net gain of BLM-administered, but would also seek to acquire lands in PPMA and Washoe County. Alternative B would identify 34 percent (93,700 acres) more land for disposal compared to Alternative A.

Alternative B would manage 580,000 acres as ROW exclusion with effects similar to those under Alternative A and described in the *Nature and Types of Effects*. Management under Alternative B would avoid new ROW development on 1,195,800 acres. Compared to Alternative A, which has no ROW avoidance criteria, Alternative B would result in more limitations on future ROW development. Alternative B would affect the location and extent of future ROW development by emphasizing reuse of existing ROWs on disturbed areas, encouraging collocation and consolidation of ROWs in priority wildlife habitats, and applying standard operating procedures and BMPs for authorizations to mitigate disturbance in select areas.

Effects on the location and extent of new communication infrastructure would be similar to Alternative A, with the exception that Alternative B would allow new development when collocation is not feasible.

Effects under Alternative C

Management under Alternative C would have the greatest potential to increase the amount of BLM-administered lands by not identifying any lands for disposal and seeking acquisition of lands within PPMA and PGMA and within Washoe County. Lands would be acquired only if the acquisition would enhance

resource values and provide for conservation/preservation of habitat and cultural resources.

Management under Alternative C would limit the BLM's ability to meet future ROW demand by managing 2,675,800 acres as a ROW exclusion area. Prohibitions on new ROW development would apply to 2,675,800 acres. Management of an additional 369,300 acres as ROW avoidance would affect lands and realty by limiting the location, extent, and types of new ROW development in those areas. Compared to Alternative A, which has no ROW avoidance criteria, Alternative C would result in more limitations on future ROW development. Alternative C would further affect the location and extent of future ROW development by emphasizing reuse of existing ROWs on disturbed areas, encouraging collocation and consolidation of ROWs in priority wildlife habitats.

Effects on communication leases would be the same as Alternative B.

Effects under Alternative D

Alternative D would have the greatest potential to decrease the amount of BLM-administered lands by identifying 332,500 acres of land for disposal and 31,870 acres for transfer.

Land acquisitions proposed under Alternative D would have similar effects as Alternative B, with the exception that under Alternative D, the BLM would also seek to acquire lands within PGMA.

Exclusions on new ROW development under Alternative D would have the same effects on the lands and realty program as Alternative A. Management of 1,226,100 acres as ROW avoidance would limit the location and type of ROWs in those areas and would decrease the BLM's ability to accommodate new ROW demand in those areas compared to Alternative A. Within urban interface zones, the use of standard operating procedures, BMPs and other design and location requirements would have similar effects as Alternative B in other areas to mitigate disturbance.

Effects on communication leases would be the same as Alternative B.

Effects under Alternative E

Effects on lands and realty from land tenure actions under Alternative E would be similar to Alternative D and would have the potential to reduce the amount of BLM-administered land in the planning area compared to Alternative A. Under Alternative E, the BLM would identify 267,200 acres of land for disposal, which is 35 percent more than Alternative A. An additional 30,670 acres would be identified for transfer with effects similar to those described for disposed lands.

Alternative E would allow the BLM to meet future ROW demand on 57 percent of the planning area. Of the acres, Alternative E would prohibit future ROWs on 605,900 acres and avoid ROWs on 1,448,200 acres. Management that would affect the location and extent of future ROW development from collocation and reuse of existing ROW requirements would have similar effects as Alternative B.

Effects on communication leases would be the same as Alternative B.

Lands and Realty: Effects from Renewable Energy

Effects Common to All Alternatives

Under all alternatives, national priority would continue to prioritize BLM-administered lands for new renewable energy development. This would lead to continued or increased demand for wind and solar energy ROWs.

Effects under Alternative A

The potential for new wind and solar energy development would be highest under Alternative A. The BLM would manage 905,900 acres as solar variance areas for utility-scale development and no acres as wind ROW avoidance areas. Under Alternative A, renewable energy would continue to place a demand on the BLM lands and realty program for new energy ROWs.

Effects under Alternative B

Alternative B would manage 17 percent less acres than Alternative A as solar variance areas for utility-scale development and would avoid wind energy ROWs on 1,220,200 acres. Compared to Alternative A, demand for new wind and solar ROWs would be reduced.

Effects under Alternative C

Alternative C would manage the smallest portion of the planning area (578,400 acres) as solar variance areas for utility-scale development and would place the greatest restrictions on wind energy development by managing 2,073,200 acres as wind energy ROW exclusion areas including the Virginia City National Historic Landmark District ACEC. Compared to Alternative A, the BLM lands and realty program would process fewer applications for new wind and solar energy ROWs.

Effects under Alternative D

Alternative D would manage 233,800 fewer acres than Alternative A as solar variance areas for utility-scale solar development and would avoid wind energy ROWs on 1,228,100 acres. Compared to Alternative A, the demand for new wind and solar ROWs would be reduced.

Effects under Alternative E

Alternative E would manage 276,000 fewer acres than Alternative A as solar variance areas for utility-scale solar development and would avoid wind energy

ROWs on 956,900 acres and would exclude wind energy ROWs on 629,900 acres, including the Virginia City National Historic Landmark District ACEC. Compared to Alternative A, the smaller solar variance areas and larger wind avoidance areas under Alternative E would reduce demand for those types of ROWs.

Lands and Realty: Effects from Areas of Critical Environmental Concern

Effects Common to All Alternatives

Because the management of ACECs under all alternatives would be to protect relevant and important resource values, ACEC management priorities would directly and indirectly affect the lands and realty program's ability to carry out land tenure actions or accommodate new ROW demand where those actions would affect the relevant and important values for which the ACEC was designated.

Effects under Alternative A

Alternative A would continue to manage 6 ACECs totaling 21,800 acres. Of these, only the 470-acre Virginia Range Williams Combleaf Botanical ACEC would include management actions that could directly affect the lands and realty program. Land acquisitions would have the potential to consolidate fragmented land holdings within the ACEC and improve BLM land management efficiency in those areas. Noncontiguous lands acquired for habitat protection would decrease BLM management efficiency.

Effects under Alternative B

Alternative B would designate 345,600 more acres of ACECs than Alternative A. ACEC management would directly affect new ROW development potential by excluding new ROWs within the 15,900-acre Stewart Valley Paleontological ACEC, 43,300 acres of the Fox Peak Cultural ACEC, 10,300 acres of the Namazii Wunu Cultural ACEC, and 2,500 acres of the Tagima aša Cultural ACEC. Additionally, Alternative B would avoid ROWs on 278,000 acres in the following ACECs:

- Black Mountain/Pistone Archaeological District ACEC
- Churchill Narrows Buckwheat Botanical ACEC
- Fox Peak Cultural ACEC
- Greater Sand Mountain ACEC
- Grimes Point Archaeological District ACEC
- Incandescent Rocks Scenic ACEC
- Namazii Wunu Cultural ACEC
- Pah Rah Basin Petroglyph ACEC
- Ruhenstroth Paleontological ACEC

- Tagim aša Cultural ACEC
- Virginia City National Landmark Historical District ACEC

Compared to Alternative A, greater restrictions on ROW development from ACEC management under Alternative B would limit ROW development potential in those areas and could redirect the demand for future development to adjacent areas.

Effects under Alternative C

ACEC management under Alternative C would have the greatest effects on the lands and realty program by prohibiting or restricting new ROWs within ACEC boundaries. Alternative C would designate 16 percent (786,270 acres) of the planning area as ACECs. This would result in 764,470 more acres of ACECs than Alternative A.

Managing the following ACECs as ROW exclusion areas would eliminate ROW development potential on 644,500 acres:

- Black Mountain/Pistone Archaeological District ACEC
- Carson wandering skipper ACEC
- Churchill Narrows Buckwheat Botanical ACEC
- Clan Alpine Greater Sage-Grouse ACEC (for linear types of ROWs only)
- Desatoya Greater Sage-Grouse ACEC
- Dixie Valley Toad ACEC
- Fox Peak Cultural ACEC
- Greater Sand Mountain ACEC
- Grimes Point Archaeological District ACEC
- Incandescent Rock Scenic ACEC
- Lassen Red Rocks Scenic ACEC
- Namazii Wunu Cultural ACEC
- Pah Rah Basin Petroglyph ACEC
- Pine Nut Bi-State Sage Grouse ACEC
- Pine Nut Mountains Williams Combleaf Botanical ACEC
- Ruhenstroth Paleontological ACEC
- Sand Springs Desert Study Area ACEC
- Stewart Valley Paleontological ACEC
- Tagim aša Cultural ACEC

- Virginia Mountains Greater Sage-Grouse ACEC

Within the following ACECs proposed under Alternative C, new ROWs would be avoided (42,600 acres):

- Churchill Narrows Buckweat Botanical ACEC
- Fox Peak Cultural ACEC
- Greater Sand Mountain ACEC
- Grimes Point Archaeological District ACEC
- Stewart Valley Paleontological ACEC
- Virginia City National Landmark Historic District ACEC

For the Sand Mountain ACEC, where new ROWs would be restricted to existing corridors, the lands and realty program could only accommodate new ROW demand if the proposed development would not conflict with existing infrastructure in the corridor.

Direct Impacts from restrictions on new land use authorizations under Alternative C would be consistent with those discussed within the *Nature and Types of Effects*. Greater restrictions on ROW development from ACEC management under Alternative C could also indirectly affect non-ACEC lands by redirecting the demand for future development to those adjacent areas.

Effects under Alternative D

Alternative D would designate 11 ACECs that would cover 180,000 acres of the planning area. Management of these ACECs would result in more limitations on ROW development compared to Alternative A. The following ACECs would manage a total of 113,500 acres as ROW avoidance areas:

- Black Mountain/Pistone Archaeological District ACEC
- Grimes Point Archaeological District ACEC
- Incandescent Rocks Scenic ACEC
- Pah Rah High Basin Petroglyph ACEC
- Ruhenstroth Paleontological ACEC
- Tagim aša Cultural ACEC

Impacts from avoiding new land use authorizations under Alternative D would be consistent with those discussed within the *Nature and Types of Effects*.

Effects under Alternative E

Alternative E would manage for three more ACECs than Alternative A for a total of 82,800 acres of ACECs. Management of these ACECs would result in more limitations on future ROW development compared to Alternative A,

including by eliminating new ROW development potential on 67,100 acres within the following ACECs:

- Fox Peak Cultural ACEC (Job Peak WSA portion only)
- Pah Rah Basin Petroglyph ACEC
- Ruhenstroth Paleontological ACEC
- Stewart Valley Paleontological ACEC

Management of the 2,100-acre Grimes Point Archaeological District ACEC would reduce the likelihood of new ROWs within that ACEC boundary.

Impacts from excluding or avoiding new land use authorizations under Alternative E would be consistent with those discussed within the *Nature and Types of Effects*.

Lands and Realty: Effects from National Trails Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

There would continue to be no specific management for National Trails under Alternative A and therefore no effects on lands and realty.

Effects under Alternative B

Alternative B would result in more NHT-related restrictions on new land use authorizations than Alternative A by managing 38,200 acres (0.25 miles on either side) associated with the California NHT and Pony Express NHT as ROW avoidance areas. Alternative B would manage an additional 1,000 acres associated with the Pony Express NHT as ROW exclusion areas. Further restrictions on noise could limit the types of uses permitted within proximity to those trails.

Effects under Alternative C

Alternative C would result in the most NHT-related restrictions on new land use authorizations by managing 257,400 acres (2.5 miles on either side) associated with the Pony Express and California NHTs as ROW avoidance and 238,500 acres as ROW exclusion. Further restrictions on noise could limit the types of uses permitted within proximity to those trails.

Effects under Alternative D

Effects from NHT management on lands and realty under Alternative D would be the same as Alternative B.

Effects under Alternative E

Alternative E would result in more NHT-related restrictions on new land use authorizations than Alternative A by managing 172,500 acres (1 mile on either side) associated with the California NHT and Pony Express NHT as ROW avoidance areas and 6,600 acres associated with the Pony Express NHT as ROW exclusion areas. Further restrictions on noise could limit the types of uses permitted within proximity to those trails.

Lands and Realty: Effects from Wild and Scenic Rivers*Effects Common to All Alternatives*

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would manage three segments of the East Fork Carson River as eligible for inclusion in the NWSRS; however, because Alternative A would not specify any actions for those WSRs, there would be no impacts on lands and realty.

Effects under Alternative B

Because no river segments would be listed as eligible for inclusion in the NWSRS under Alternative B, there would be no impacts on lands and realty.

Effects under Alternative C

Alternative C would identify three segments of the East Fork Carson River as eligible for inclusion in the NWSRS. Compared to Alternative A, WSR management would result in greater restrictions on lands and realty by managing segment 1 as ROW exclusion and segments 2 and 3 as ROW avoidance. Effects from limiting and excluding ROW development include those described within the *Nature and Types of Effects*.

Effects under Alternatives D and E

Effects from WSR management on lands and realty under Alternatives D and E would be the same as Alternative B.

Lands and Realty: Effects from Wilderness Study Areas*Effects Common to All Alternatives*

There are no effects common to all alternatives.

Effects under Alternatives A, B, and D

BLM management of WSAs, which protect naturalness and preserve opportunities for solitude and primitive recreation, would exclude those areas from any future permanent ROW development or other land use that would result in surface disturbance. If released from WSA consideration, areas would be open to ROW development. Limitations on other surface disturbing

activities (e.g., mineral development and OHV use) in these areas would indirectly reduce or eliminate demand for new ROWs to support those uses.

Effects under Alternatives C and E

Alternatives C and E would manage WSAs as ROW exclusion areas with no opportunities for the lands and realty program to meet any future ROW demand in those areas. If released from consideration as WSAs, the Carson Iceberg, Clan Alpine, and Desatoya Mountains areas would continue to be managed as ROW exclusion areas with the same effects as those described within the *Nature and Types of Effects*. Limitations on other surface disturbing activities (e.g., mineral development and OHV use) in these areas would indirectly reduce or eliminate demand for new ROWs to support those uses.

Lands and Realty: Effects from Back Country Wildlife Conservation Areas

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A, B, D, and E

There would be no BCWCAs under Alternatives A, B, D, or E and therefore no effects on lands and realty.

Effects under Alternative C

Under Alternative C, the BLM would manage 17 percent (817,800 acres) of the planning areas as BCWCAs, within which new ROW development would be excluded unless development could be placed within existing ROWs. Compared to Alternative A, prohibitions on new ROWs in BCWCAs would reduce the ability of the BLM to accommodate demand in those areas and could redirect demand to adjacent areas.

Lands and Realty: Effects from Tribal Interests

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A, B, and D

There would be no effects from Tribal Interests on lands and realty under Alternatives A, B, or D.

Effects under Alternative C

Alternative C would avoid new ROWs within a 1-mile radius of a burial site. This would reduce the ability of the BLM to accommodate future ROW demand in those areas.

Effects under Alternative E

Effects on lands and realty from Tribal Interests under Alternative E would be the same as Alternative C.

Lands and Realty: Cumulative Effects

Cumulative impacts on lands and realty are the result of past, present, and reasonably foreseeable future actions within and next to the planning area that increase or decrease demand for land tenure actions and land use authorizations (See **Table 4-1**). Demand for land tenure adjustments and land use authorizations have traditionally been high within the planning area, mainly as a result of urbanization, fluid mineral development, and renewable energy development. As urban areas such as Reno/Sparks, Carson City, Minden/Gardnerville, Fernley, Fallon, and Dayton continue to grow, public lands will continue to be considered as a source of geothermal, wind, biomass, and solar energy as well as areas of potential future urban development. Concurrent management of public lands to protect sensitive biological, historical, cultural, and visual resources would continue to limit the locations where new authorizations could be approved and where lands would be retained or disposed.

Urbanization in the planning area contributes to cumulative effects on lands and realty by increasing pressures on public lands for future urban development (i.e., via disposal or transfer), ROWs, leases, and public uses under the R&PP Act. In addition to community-level demands that seek the use of public lands for open space and flood protection, expanding urban footprints are increasing the demand for land tenure adjustments to accommodate future urban growth. Although there has been a 29,300 acre net increase in the amount BLM-administered lands in the planning area since 2001, land disposals and transfers to support urban growth are expected in the future. Land acquisitions and transfers to protect sensitive resource areas, such as riparian areas, sensitive species habitat, and isolated parcels in ACECs and other special management areas may offset any disposals or result in a net increase in BLM-administered lands.

Fluid mineral (mainly geothermal) development has occurred, is occurring, and will continue to occur on both federal and nonfederal mineral estate lands within the planning area. These actions have and will continue to place demands on the BLM lands and realty program through ROW applications for transmission lines, roads, and pipelines. There are currently 148 geothermal leases in the planning area with an active geothermal power production of 183 MW (BLM 2013f). Exploration drilling on these leases is expected to increase future geothermal energy production and therefore the need for additional land use authorizations.

The potential for renewable energy development in the planning area has traditionally contributed to the number of ROW applications received. The prospect of profitable wind energy development projects led to 39 applications being received in the planning area since 2002; and while most applications led to testing and monitoring projects, all but three have been allowed to expire by

the applicants. Only one utility-scale wind development project has a pending status.

The National Renewable Energy Laboratory data (NREL 2013) shows that portions of the planning area also have moderate to high potential for solar energy, particularly in the southern portion of the planning area. Since 2002, there have been two applications for solar development. Luning Solar near Hawthorne was issued a ROW grant for a 575-acre project in July, 2010 but construction has not started.

As the demand for renewable sources of energy increases, as many as four new wind and solar development projects are expected in the planning area. These projects would require ROWs and numerous supporting land use authorizations and would therefore cumulatively affect the lands and realty program.

CTTM actions that would close areas to motorized travel could impact ROW development where closures would restrict access to a potential ROW location. In areas open to motorized travel and livestock grazing, there would continue to be the potential for conflicts with existing and proposed ROWs, communication leases, and other authorized land uses.

The incremental effects from the demands on lands and realty would vary by alternative due to varying levels of management to protect biological, cultural, and visual resources. In general, Alternatives A and B specify fewer ROW avoidance or exclusion areas to protect sensitive species, wildlife habitats, and cultural resources. Under these alternatives, lands and realty actions would be expected to increase. Alternative C is the most restrictive and would have the greatest potential to incrementally decrease lands and realty actions over time. Alternatives D and Alternative E, which take more balanced approaches to resource and resource use management, would have incrementally less effects on lands and realty.

Of all the resource programs addressed under Alternatives B through E, Special Status Species has the greatest potential to affect future lands and realty activity, particularly under Alternative C. Cumulative effects from GRSG conservation measures within the planning area and on BLM-administered lands throughout the Great Basin would have the potential to reduce or eliminate certain types of ROW development and require land tenure actions to increase the amount of GRSG habitat in public ownership. Closures of areas to mineral development, renewable energy, road development, and grazing would further reduce demand for land use authorizations.

4.4.7 Renewable Energy

Summary

Management actions that impact renewable energy (i.e., solar, wind and biomass) are those that increase or decrease the amount of public land available to accommodate demand for new renewable energy development. Effects on renewable energy are greatest in areas of high renewable energy resource potential. For example, excluding wind energy ROWs in an area of high wind resource potential would result in a greater impact on renewable energy than the same management in an area of low wind resource potential.

Alternative A would have the least impact on renewable energy by allowing for wind and solar energy development on the largest areas with moderate to high resource potential. For Alternatives B through E, because proposed management would result in little to no change in the availability of moderate to high resource potential areas for future development, effects on renewable energy under those alternatives would be similar or the same across those alternatives. For example, the total areas of Class 5, 6 and 7 wind power classification areas within ROW avoidance areas across Alternatives B through E would be the same, resulting in the same limitations on wind energy development in those areas across alternatives. For solar energy development, Alternative C would be the most restrictive of all the alternatives by managing the smallest area of good and moderate solar resource potential within a solar variance area. The size of solar variance areas under Alternatives B, D, and E would result in similar opportunities for new utility-scale solar development, with Alternative B managing the largest areas of good and moderate solar resource potential within solar variance areas and Alternative E managing the least.

Methods of Analysis

Methods and Assumptions

The following methods and assumptions were used to assess the impacts on renewable energy:

- The nature and types of potential impacts on renewable energy from proposed actions under each alternative are based on:
 1. Numerical data gathered during the planning process, particularly data related to wind and solar resource potential
 2. Reasonable Foreseeable Development assumptions for wind, solar, and biomass
 3. BLM interdisciplinary team knowledge of the resource
 4. Input provided during the public scoping process

Where possible, this analysis uses quantitative data to describe impacts on renewable energy from other resources and resource use programs. Qualitative information is also used to support quantitatively-based analysis or where numerical data does not exist. In all cases, best professional judgment is used in evaluating effects.

- National- and state-level policies will continue to encourage renewable energy development on public lands, which will subsequently maintain or increase demand for new solar, wind, and biomass energy projects within the planning area.
- Within solar variance areas, as identified in the BLM Solar PEIS (BLM 2012I), the probability of future utility-scale solar energy development is greater than in areas outside variance boundaries.
- Unless specific management is proposed for renewable energy ROWs, the management of areas as ROW exclusion and avoidance areas would decrease the BLM's ability to accommodate new wind and solar energy development. However, only in areas where renewable energy resource potential exists would there be a quantifiable impact on renewable energy.
- All future renewable energy ROW proposals on BLM administered lands will be consistent with Regional and County Master Plans, Nevada State Statutes, and the BLM Solar (BLM 2012I) and Wind PEIS (BLM 2005b) documents.

Indicators

The following indicators were used to assess the degree of impacts on renewable energy in the planning area:

- Management actions (e.g., ROW avoidance or exclusion areas), particularly in relation to renewable energy potential that would increase or decrease the BLM's ability to accommodate future renewable energy demand.

Nature and Type of Effects

Impacts on renewable energy occur as a result of restrictions on the location, type, or extent of renewable energy development, such as ROW exclusion and avoidance areas. The degree of impacts on renewable energy in avoidance and exclusion areas would be dependent on the resource potential in those areas. A ROW exclusion area is one that is not available for a new ROW under any conditions. Impacts on renewable energy would be greatest where high resource potential coincides with a ROW exclusion area. In ROW avoidance areas, ROW applications for new renewable energy development could be submitted, but a project proposed in these areas would be subject to additional requirements. Examples of the additional requirements are resource surveys and reports, construction and reclamation engineering, long-term monitoring,

special design features, special siting requirements, timing limitations, and rerouting. Such requirements could affect the project scope, delay or reduce energy availability, limit future access, and increase project costs. As a result of special surveys and reports, alternative development locations may need to be identified and selected.

Proposed management for the following resources would have no impacts on renewable energy and are therefore not discussed in further detail below: air quality, wild horses and burros, wildland fire ecology and management, paleontological resources, forestry and woodland product management, livestock grazing, geology and minerals management, Back Country Byways, public health and safety, and interpretation and education.

Renewable Energy: Effects from Climate Management

Effects Common to All Alternatives

Under all alternatives, national- and state-level policies would continue to encourage the use of public lands for low- or no-carbon energy sources. Continued emphasis on wind, solar, biomass and other renewable energy sources would be expected to increase the number of renewable energy ROW applications received.

Effects under Alternative A

There would continue to be no climate management under Alternative A and therefore no effects on the lands and realty program.

Effects under Alternative B

Management under Alternative B to reduce human-caused ecosystem stressors and promote habitat connectivity could result in some renewable energy ROW applications being modified or denied if they conflict with these objectives.

Effects under Alternative C

Effects under Alternative C would be similar to Alternative B, but could result in greater restrictions, particularly in PPMAs.

Effects under Alternative D

Effects under Alternative C would be the same as Alternative B.

Effects under Alternative E

Effects under Alternative E would be the same as Alternative C.

Renewable Energy: Effects from Soil Resources

Effects Common to All Alternatives

Under all alternatives, BLM management would require that activities on sensitive soils develop BMPs or other mitigation measures to reduce impacts on

those soils. These requirements could affect feasibility of wind energy ROWs and increase development costs.

Effects under Alternative A

Because the management of soil resources would not restrict or enhance the BLM's ability to meet renewable energy objectives, there would be no effects from soil resources management under Alternative A.

Effects under Alternative B

Alternative B would avoid new surface disturbing activities on slopes greater than 30 percent. This would reduce the potential for future renewable energy ROW development in those areas unless the project could develop an acceptable erosion control strategy. Because higher wind resource potential is located in mountainous terrain and solar development requires a continuously flat surface, the potential for impacts would be greatest for wind energy development and negligible or none for solar development.

Effects under Alternative C

Alternative C would avoid new surface disturbing activities on slopes between 21 percent and 39 percent and prohibit development on slopes greater than 40 percent. This would have the potential to reduce or eliminate future renewable energy development in those areas unless the project could develop an acceptable erosion control strategy. Because higher wind resource potential is located in mountainous terrain and solar development requires a continuously flat surface, the potential for impacts would be greatest for wind energy development and negligible or none for solar development.

Effects under Alternative D

Effects on renewable energy from soil resources management under Alternative D would be the same as Alternative C.

Effects under Alternative E

Effects on renewable energy from soil resources management under Alternative E would be the same as Alternative C.

Renewable Energy: Effects from Water Resources

Effects Common to All Alternatives

For all alternatives, renewable energy projects would be required to comply with all applicable state water quality standards. Certain renewable energy development projects could be supported or restricted by state water law.

Effects under Alternative A

Because the management of water resources would not restrict or enhance the BLM's ability to meet renewable energy demand, there would be no effects under Alternative A.

Effects under Alternative B

Effects on renewable energy from water resources management under Alternative B would be the same as Alternative A.

Effects under Alternative C

Alternative C would prohibit surface disturbing activities in source water protection zones. This would eliminate the potential for siting new renewable energy development in those areas.

Effects under Alternative D

Effects on renewable energy development from the management of water resources under Alternative D would be the same as Alternative C.

Effects under Alternative E

Effects on renewable energy development from the management of water resources under Alternative E would be the same as Alternative B.

Renewable Energy: Effects from Vegetation Resources

Effects Common to All Alternatives

All alternatives would require renewable energy operations to have a noxious weed program in place to manage and treat invasive plants and noxious weeds.

Effects under Alternative A

There would continue to be no vegetation resources management actions under Alternative A that would restrict or enhance the BLM's ability to meet renewable energy development demands, and therefore no effects.

Effects under Alternative B

Effects on renewable energy development from the management of vegetation resources under Alternative B would be the same as Alternative A.

Effects under Alternative C

Alternative C would affect the placement of new renewable energy ROWs by excluding all types of ROWs within 200-feet of riparian and wetland areas and precluding surface disturbance in floodplains and near springs or public water sources. Collectively, these restrictions would limit the BLM's ability to accommodate future demand for renewable energy ROWs in those areas. Alternative C could be particularly impactful for solar energy projects, which, because they require a continual water source, are often located near existing water resources.

Effects under Alternative D

Alternative D would limit the placement of new renewable energy ROWs within riparian and wetland areas and precluding surface disturbance within 200 feet of riparian and wetland areas and within 500 feet of springs. Effects would be similar to those described for Alternative C.

Effects under Alternative E

Direct effects on renewable energy development from vegetation resources management would be the same as Alternative A.

Renewable Energy: Effects from Fish and Wildlife Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Because there would continue to be no fish and wildlife management actions that would restrict or promote lands and realty objectives, there would be no effects under Alternative A.

Effects under Alternative B

Alternative B would reduce the potential for future renewable energy development in migratory waterfowl pathways, raptor nests, and bat habitats. Additional requirements to maintain habitat connectivity and mitigate disturbance from new surface disturbing activities could indirectly affect renewable energy development by limiting linear ROWs, such as transmission lines, needed to support renewable energy projects.

Effects under Alternative C

Alternative C would lead to the greatest potential for impacts on future renewable energy development by excluding new ROWs within priority habitats and migratory waterfowl pathways or near raptor nests and bat habitats. Additional requirements to maintain habitat connectivity and mitigate disturbance from new surface disturbing activities would have effects similar to Alternative B.

Effects under Alternative D

Effects on lands and realty from fish and wildlife management under Alternative D would be similar to Alternative B.

Effects under Alternative E

Alternative E would have the potential to limit future renewable energy development by avoiding new ROWs within big game habitats, migratory bird pathways and nesting sites, within 0.25 miles of bat habitats (0.5 miles for large scale ROWs), and by prohibiting new ROWs within 0.5 miles of raptor nest sites. Additional requirements to maintain habitat connectivity and mitigate disturbance from new surface disturbing activities would lead to potential effects similar to Alternative B.

Renewable Energy: Effects from Special Status Species Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

There would continue to be no special status species management actions under Alternative A that would restrict or enhance the BLM's ability to meet renewable energy development demands and therefore no effects.

Effects under Alternative B

Alternative B would avoid ROW development in PPMA (275,600 acres). This would limit the potential for new renewable energy development in those areas. Prohibitions on structures 8 feet or taller within 1.8 miles of active lek sites would limit the placement of new wind turbines and associated infrastructure, such as transmission lines, in those buffer areas. Timing restrictions for surface disturbing activities within PPMA could also make renewable energy development impractical or infeasible in Greater Sage-Grouse habitat.

Effects under Alternative C

Alternative C would result in the greatest potential for impacts on renewable energy development by managing PPMA and PGMA (414,200 acres) as a ROW exclusion area. Eliminating development opportunities in these areas could redistribute demand to adjacent federal and non-federal lands throughout the planning area.

Prohibitions on tall structures and timing restrictions for surface disturbing activities would have the same potential for effects as Alternative B, but also apply to PGMA.

Effects under Alternative D

Alternative D would manage the 414,200 acres within PPMA and PGMA as ROW avoidance. This would decrease the prospect of renewable energy development in those areas, while potentially indirectly increasing demand elsewhere in the planning area. The potential for other direct effects on lands and realty from special status species management would be the same as Alternative B.

Effects under Alternative E

The potential for direct effects on lands and realty from special status species management under Alternative E would be the same as Alternative D.

Renewable Energy: Effects from Wildland Fire Ecology and Management*Effects Common to All Alternatives*

Proposed fuels treatments under all alternatives, including removal of vegetation, could provide a consistent feedstock supply to support new biomass energy development.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Renewable Energy: Effects from Cultural Resources Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Because there would continue to be are no cultural resources management actions that would restrict or promote renewable energy development, there would be no effects under Alternative A.

Effects under Alternative B

Management of cultural resources under Alternative B would have the potential to result in localized reductions in new renewable energy development opportunities by managing a 0.25-mile buffer around historic trails and all historic properties, districts, landmarks, and TCPs as ROW avoidance areas. Avoiding ROW development in these areas could reduce development opportunities or shift future development proposals to adjacent federal and non-federal lands depending on resource potential.

Effects under Alternative C

Alternative C would result in the greatest potential for impacts on renewable energy development by managing historic properties and districts, landmarks, and TCPs as ROW exclusion and a 2.5-mile buffer around historic trails as ROW avoidance. Restrictions or prohibitions on ROW development could reduce development opportunities or shift future development to adjacent areas depending on resource potential.

Effects under Alternative D

Effects on renewable energy from cultural resources management under Alternative D would be the same as Alternative B.

Effects under Alternative E

Management of cultural resources under Alternative B would decrease the amount of land available for renewable energy development by managing a 1 mile buffer around historic trails, historic properties, landmarks, districts, and

TCPs, the 15,900 acre Wyemaha Archaeological District, and the 3,100-acre Pistone site as ROW avoidance areas. Avoiding ROW development in these areas could reduce demand in the restricted areas or shift future ROWs to adjacent areas.

Alternative E would also exclude new wind energy ROWs within the Virginia City National Historic Landmark District. Prohibitions on wind energy would eliminate future wind energy development potential within the District and could shift future development to adjacent federal and non-federal areas depending on resource potential.

Renewable Energy: Effects from Visual Resources Management

Effects Common to All Alternatives

Under all alternatives, the BLM would manage resource and resource uses consistent with applicable VRM class objectives. Objectives for VRM Class I and II, which respectively specify preservation and retention of existing landscape characteristics, would have a greater likelihood of limiting the location and/or applying mitigation measures to renewable energy development projects. Fewer restrictions would be likely in VRM Classes III and IV.

Effects under Alternative A

Alternative A would continue to manage 13 percent (602,400 acres) of the planning area as VRM Class I or II. New renewable energy development, particularly wind and solar energy projects, would conflict with VRM objectives in these areas and likely be approved only if re-located to VRM Class III or IV areas.

Effects under Alternative B

Similar to Alternative A, management of 13 percent (620,900 acres) of the planning area as VRM Class I or II would affect the location and types of renewable energy development allowed in those areas. In addition to designating VRM Classes I and II, Alternative B would provide VRM Class III and IV objectives for the remainder of the planning area (4,182,400 acres). Visual resource management objectives would support new renewable energy development within these areas, particularly within VRM Class IV areas.

Effects under Alternative C

Visual resources management under Alternative C would have the greatest potential to limit renewable energy development by managing 1,715,800 acres VRM Class I or II. Effects on renewable energy development in these areas would be the same as those described under Alternative A.

Effects under Alternative D

Effects from visual resources management under Alternative D would be similar to Alternative B, but could lead to more renewable energy development by managing 3,986,900 acres as VRM Class IV.

Effects under Alternative E

Effects on renewable energy from Class I and II VRM objectives would be similar to Alternative B, but approximately 475,000 more acres would be managed as VRM Class II, resulting in more restrictions on renewable energy development.

Renewable Energy: Effects from Caves and Cave Resources Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

There would continue to be no proposed actions that would restrict or promote renewable energy development and therefore no effects from caves and cave resources management under Alternative A.

Effects under Alternative B

Management to protect Dynamite and Hidden Caves would avoid new renewable energy development within 0.25 miles of Dynamite Cave and 500 feet of Hidden Cave, subsequently limiting the BLM's ability to accommodate future demand in those areas.

Effects under Alternative C

Management to protect Dynamite and Hidden caves would prohibit ROW development within 0.5 miles of Dynamite Cave and 500 feet of Hidden Cave, subsequently eliminating the BLM's ability to accommodate future renewable energy development demand in those areas.

Effects under Alternative D

Limitations on the BLM's ability to accommodate future renewable energy demand near caves and cave resources under Alternative D would lead to the same effects as Alternative B.

Effects under Alternative E

Prohibitions on the BLM's ability to accommodate demand for future renewable energy development near caves and cave resources under Alternative D would have the same effects as Alternative C.

Renewable Energy: Effects from Forestry and Woodland Product Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Forestry and Woodland Product Management under Alternative A would continue to allow for the sale of standing green pinyon and juniper as well as dead standing and down fuel woods. These forest products would continue to

have the potential to support localized biomass energy production. Because of high costs to transport wood products, any new biomass energy facilities would likely be located within close proximity to the biomass resource.

Effects under Alternative B

Forestry and Woodland Product Management under Alternative B would allow for the extraction and utilization of vegetative products to supply biomass facilities. Because of high costs to transport wood products, any new biomass energy facilities would likely be located within close proximity to the biomass resource.

Effects under Alternative C

Alternative C would not support vegetation extraction for public or biomass energy use. This would eliminate opportunities for new biomass energy production in the planning area.

Effects under Alternative D

Alternative D would result in the development of a utilization plan for vegetation products. This could allow for new biomass facilities if the plan specifies extraction and utilization levels adequate to support biomass energy development.

Effects under Alternative E

Forestry and Woodland Product Management under Alternative E would allow for the extraction and utilization of vegetative products to supply small-scale (less than 3 megawatt) biomass facilities. Because of high costs to transport wood products, any new biomass energy facilities would likely be located within close proximity to the biomass resource.

Renewable Energy: Effects from Livestock Grazing Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Management under Alternative A would allow livestock grazing to continue under current levels throughout 99 percent (4,796,600 acres) of the planning area. There would continue to be 905,400 acres (99 percent) of solar variance areas proposed under Alternative A overlapping open allotments. This would maintain the potential for conflict between livestock and future solar development within those variance areas.

Effects under Alternative B

Effects on renewable energy under Alternative B would be similar to Alternative A, but would apply to a smaller (773,400 acres) variance area.

Effects under Alternative C

Alternative C would reduce the portion of the planning area available for livestock grazing by 2,695,300 acres and reduce AUMs by 110,500 acres. Of the 578,400 acres of solar variance areas under Alternative C, 330,110 acres would be within open allotment areas. Compared to Alternative A, management under Alternative C would reduce the potential for renewable energy development projects to conflict with livestock grazing management.

Effects under Alternative D

Of the acres of solar variance areas under Alternative D, 672,100 acres would be within open grazing allotment areas, therefore effects would be the same as Alternative A, but apply to a smaller area.

Effects under Alternative E

Effects on renewable energy under Alternative E would be the same as Alternative D, except that Alternative E would manage 629,400 acres of solar variance areas.

Renewable Energy: Effects from Recreation and Visitor Services*Effects Common to All Alternatives*

Under all alternatives, the BLM would continue to manage recreation and visitor services to minimize conflicts with other resources and resources uses. There would be little to no effects on renewable energy where proposed development would not conflict with Recreation and Visitor Services management objectives. Where renewable energy development would have the potential to conflict with recreation objectives (e.g., within RMAs) resolution of these conflicts could affect the location and/or extent of renewable energy development proposals.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Renewable Energy: Effects from Comprehensive Travel and Transportation Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would continue to manage 80 percent (3,840,300 acres) of the planning area as open to cross-country motorized and mechanized travel with the majority of the remaining area limited to existing routes. While allowing unrestricted cross-country travel would provide unlimited access to future renewable energy project sites for construction and maintenance activities, it also raises the potential for disruption or conflict.

CTTM management under Alternative A would also close 38,700 acres to motorized travel. Because opportunities for motorized access would be eliminated in these areas, there would be limited to no potential for new or expanded renewable energy development in these areas.

Effects under Alternative B

Alternative B would limit motorized travel to existing roads and trails throughout 97 percent (4,677,000 acres) of the planning area. Limiting motorized travel to existing routes would maintain access opportunities for future renewable energy ROWs and therefore have little or no effect on renewable energy. Compared to Alternative A, Alternative B would manage 3,745,000 fewer acres (78 percent) as open to motorized and mechanized travel. This would decrease the potential for conflict with renewable energy projects. Alternative B would close 7,700 less acres to motorized travel compared to Alternative A. This would maintain future renewable energy ROW opportunities in those areas.

Effects under Alternative C

Alternative C would manage the most areas (1,788,500 acres) as closed to motorized travel thereby restricting opportunities to access new renewable energy ROWs in those areas. In all but 1,300 acres of the remaining portion of the planning area, travel would be limited to existing routes with benefits from reduced conflict with renewable energy similar to those described under Alternative A.

Effects under Alternative D

CTTM under Alternative D would have similar effects on renewable energy as Alternative B by limiting motorized travel to existing routes throughout 99 percent (4,748,400 acres) of the planning area, while closing less than one percent (32,200 acres) to motorized travel.

Effects under Alternative E

Alternative E would have the least effects on renewable energy from CTTM area closures by managing the smallest portion of the planning area (30,300 acres) as closed to motorized travel. Compared to Alternative A, CTTM under Alternative E would provide more opportunities to access to future renewable energy ROWs. The nature and type of effects from managing 98 percent (4,717,300 acres) of the planning area as limited to existing routes would be the same as Alternative B.

Renewable Energy: Effects from Lands and Realty*Effects Common to All Alternatives*

As a means to minimize land disturbance from future infrastructure development, the BLM would continue to manage 440,000 acres of utility corridors and encourage their use for transmission lines 60kV or larger. Corridors can provide potential renewable energy developers with greater certainty as to the location of future infrastructure and would increase the likelihood of renewable energy projects being sited next to these corridors.

Effects under Alternative A

Alternative A would continue to recommend 4 percent (179,700 acres) of the planning area for disposal. This would eliminate opportunities for the BLM to accommodate renewable energy development on disposed lands.

Alternative A would also exclude ROW development potential on 12 percent (564,100 acres) of the planning area. However, none of these acres have development potential for solar energy development. All areas with high solar potential and having a wind power classification of 3 or higher would continue to be open to new renewable energy ROW development and therefore unaffected by lands and realty.

Management under Alternative A that would limit ROW development in high erosion susceptibility areas, could also continue to affect renewable energy development opportunities in those areas.

Effects under Alternative B

The potential for effects from land tenure decisions on renewable energy opportunities would be greater under Alternative B, which would recommend 32 percent (93,800 acres) more land for disposal compared to Alternative A.

The management of 580,000 acres as ROW exclusion areas under Alternative B would have the same effects on wind and solar development potential as those under Alternative A and described in the *Nature and Types of Effects*. However, management under Alternative B would also avoid new ROW development on 1,195,800 acres. Within the avoidance areas, 149,400 acres would have good solar resource potential and 6,600 would have moderate potential. There would also be 68,800 acres with a wind power classification of 3 or higher. Compared

to Alternative A, which has no ROW avoidance criteria, Alternative B would result in more limitations on future renewable energy development.

Effects from restrictions on land use authorizations in high erosion susceptibility areas would be the same as Alternative A.

Effects under Alternative C

Management under Alternative C would have the greatest potential to increase the amount of BLM-administered public lands. However, because acquisitions would only be pursued to enhance resource values and provide for conservation/preservation of habitat and cultural resources, it would be unlikely that those lands would be available for renewable energy development.

Management under Alternative C would limit the BLM's ability to approve future renewable energy ROWs by managing 2,675,800 acres as a ROW exclusion area and 369,300 acres as a ROW avoidance area. Prohibitions and limitations on new ROW development would apply to more of the planning area than under Alternative A.

Alternative C would result in the greatest impact on future renewable energy development by excluding or avoiding renewable energy development over the greatest number of acres with moderate to high solar and wind resource potential. Within the exclusion areas, 513,500 acres would have good solar resource potential and 61,400 acres would have moderate potential. There would also be 68,800 acres of land with a wind power classification of 3 or higher excluded from development under Alternative C.

Alternative C would also avoid new ROWs on 113,000 acres of good solar resource potential and 700 acres of moderate potential.

Indirectly, ROW exclusion and avoidance criteria under Alternative C would also limit or eliminate opportunities for new transmission infrastructure needed for renewable energy projects. Fewer transmission line ROWs would further diminish renewable energy development opportunities under Alternative C.

Effects under Alternative D

Alternative D would have the greatest potential to decrease the net amount of BLM-administered public lands by identifying 332,500 acres of land for disposal and 31,870 acres for transfer. If disposed of or transferred, the BLM would no longer have the jurisdiction to approve renewable energy development on those lands.

Management that would avoid or exclude new ROW development in certain areas under Alternative D would have the same effects on wind and solar energy development as Alternative B.

Avoiding ROWs would decrease renewable energy development opportunities, including on 68,800 acres with a wind power classification of 3 or higher, 18,500 acres with moderate and 588,200 acres with high solar energy potential. The BLM's ability to accommodate wind and solar energy demand in these moderate to high potential areas would be reduced compared to Alternative A.

Effects under Alternative E

The potential for effects from land tenure decisions on renewable energy under Alternative E would be similar to Alternative D and would have the potential to reduce the amount of BLM-administered land in the planning area compared to Alternative A. Under Alternative E, the BLM would identify 267,200 acres of land for disposal, which is 49 percent more than Alternative A. An additional 30,670 acres would be identified for transfer with effects similar to those described for disposed lands.

Alternative E would prohibit future ROWs on 605,900 acres and avoid ROWs on 1,448,200 acres. Although similar in size, management of avoidance area criteria would affect renewable energy development more than exclusion due to broader underlying wind and solar resource potential in avoidance areas. Where ROWs are avoided under Alternative E, 252,900 acres would have good solar resource potential and 34,100 acres would have moderate potential. There would also be 65,500 acres of land with a wind power classification of 3 or higher. ROW exclusions would apply to 600 acres of good or moderate solar potential and 2,100 acres with a wind power classification of 3. Accordingly, effects on renewable energy would consist mainly of those described in the *Nature and Types of Effects* from ROW avoidance, rather than ROW exclusion.

Renewable Energy: Effects from Renewable Energy

Effects Common to All Alternatives

Under all alternatives, national and state policies would continue to encourage renewable energy development on BLM-administered public lands. This would lead to continued or increased demand for wind and solar energy ROWs.

Effects under Alternative A

The potential for new wind and solar energy development would be highest under Alternative A. The BLM would manage 905,900 acres as solar variance areas for utility-scale development and no acres as wind ROW avoidance areas. Within solar variance areas, 736,900 acres would have moderate or high solar resource potential. Under Alternative A, the BLM would continue to be able to accommodate demand for new wind, solar, and biomass energy development.

Effects under Alternative B

Alternative B would manage 11 percent less acres than Alternative A as variance areas for utility-scale solar development and would avoid wind energy ROWs on 1,220,200 acres. While Alternative B would manage a smaller solar variance area, areas of moderate or high resource potential would account for 684,600

acres of the solar variance area compared to Alternative A. Wind energy ROW avoidance areas would limit wind energy development potential across 68,800 acres of land with a wind power classification of 3 or higher. Therefore, Alternative B would restrict the BLM's ability to accommodate new wind energy development demand compared to Alternative A.

Effects under Alternative C

Alternative C would manage the smallest portion of the planning area (578,400 acres) as variance areas for utility-scale solar development and would place the greatest restrictions on wind energy development by managing 2,073,200 acres as wind energy ROW avoidance areas and excluding wind energy ROWs in the Virginia City National Historic Landmark District ACEC. These actions would exclude wind energy development on 68,800 acres with a wind power classification of 3 or higher. Compared to Alternative A, renewable energy development potential in the planning area would be reduced under Alternative C.

Effects under Alternative D

Alternative D would manage 233,800 fewer acres than Alternative A as solar variance areas for utility-scale solar development and would avoid wind energy ROWs on 1,228,100 acres. Effects of renewable energy management on renewable resource potential and subsequent development opportunities would be similar to Alternative B, except with fewer acres of good or moderate solar potential in solar variance areas.

Effects under Alternative E

Alternative E would manage 276,000 fewer acres than Alternative A as solar variance areas for utility-scale solar development and would avoid wind energy ROWs on 629,900 acres of the planning area. Effects of renewable energy management on wind energy resource potential and subsequent development opportunities would be the same as Alternative C. For solar energy development potential, effects would be similar to Alternative C, except Alternative E would have 37,700 more acres of good or moderate solar potential in solar variance areas and therefore greater opportunities for solar energy development in those areas.

Renewable Energy: Effects from Areas of Critical Environmental Concern

Effects Common to All Alternatives

Because the management of ACECs under all alternatives would be to protect relevant and important resource values, ACEC management priorities would directly and indirectly affect new renewable energy development where those actions would diminish the relevant and important values for which the ACEC was designated.

Effects under Alternative A

There would continue to be no proposed actions that would restrict renewable energy development and therefore no effects from ACEC management under Alternative A. Under Alternative A, the BLM would continue to manage four ACECs. Management of the Steamboat ACEC would not allow renewable energy development within the ACEC boundary.

Effects under Alternative B

Alternative B would designate 345,600 more acres of ACECs than Alternative A. ACEC management would have the potential to affect new renewable energy development by excluding new ROWs within the 15,900-acre Stewart Valley Paleontological ACEC, 43,300 acres of the Fox Peak Cultural ACEC, 10,300 acres of the Namazii Wunu Cultural ACEC, and 2,500 acres of the Tagima aša Cultural ACEC. Additionally, Alternative B would avoid ROWs on 269,800 acres in the following ACECs:

- Black Mountain/Pistone Archaeological District ACEC
- Churchill Narrows Buckwheat Botanical ACEC
- Fox Peak Cultural ACEC
- Greater Sand Mountain ACEC
- Grimes Point Archaeological District ACEC
- Incandescent Rocks Scenic ACEC
- Namazii Wunu Cultural ACEC
- Pah Rah Basin Petroglyph ACEC
- Ruhenstroth Paleontological ACEC
- Tagim aša Cultural ACEC
- Virginia City National Landmark Historical District ACEC

Compared to Alternative A, greater restrictions on ROW development from ACEC management under Alternative B would limit wind, solar, and biomass development opportunities in those areas and could redirect future development to adjacent federal and non-federal areas.

Effects under Alternative C

ACEC management under Alternative C would have the greatest potential to reduce the amount of renewable energy development by prohibiting or restricting new ROWs within ACEC boundaries. Alternative C would manage 786,270 acres as ACECs. This would result in 764,470 more acres of ACECs than Alternative A.

Managing the following ACECs as ROW exclusion areas would eliminate ROW development potential on 644,500 acres:

- Black Mountain/Pistone Archaeological District ACEC
- Carson wandering skipper ACEC
- Churchill Narrows Buckwheat Botanical ACEC
- Clan Alpine Greater Sage-Grouse ACEC (for linear types of ROWs only)
- Desatoya Greater Sage-Grouse ACEC
- Dixie Valley Toad ACEC
- Fox Peak Cultural ACEC
- Greater Sand Mountain ACEC
- Grimes Point Archaeological District ACEC
- Incandescent Rock Scenic ACEC
- Lassen Red Rocks Scenic ACEC
- Namazii Wunu Cultural ACEC
- Pah Rah Basin Petroglyph ACEC
- Pine Nut Bi-State Sage Grouse ACEC
- Pine Nut Mountains Williams Combleaf Botanical ACEC
- Ruhenstroth Paleontological ACEC
- Sand Springs Desert Study Area ACEC
- Stewart Valley Paleontological ACEC
- Tagim aša Cultural ACEC
- Virginia Mountains Greater Sage-Grouse ACEC

Within the following ACECs proposed under Alternative C, new ROWs would be avoided (42,600 acres):

- Churchill Narrows Buckwheat Botanical ACEC
- Fox Peak Cultural ACEC
- Greater Sand Mountain ACEC
- Grimes Point Archaeological District ACEC
- Stewart Valley Paleontological ACEC
- Virginia City National Landmark Historic District ACEC

Direct impacts from restrictions on new land use authorizations under Alternative C would be consistent with those discussed within the *Nature and Types of Effects*.

Indirectly, ROW exclusion and avoidance criteria under Alternative C within ACECs would also limit or eliminate opportunities for new transmission infrastructure needed for renewable energy projects. Reduced potential for transmission line ROWs could further diminish renewable energy development opportunities within and next to ACECs under Alternative C. Greater restrictions on ROW development from ACEC management under Alternative C could also indirectly affect non-ACEC lands by redirecting the demand for future development to those adjacent areas.

Effects under Alternative D

Alternative D would designate 11 ACECs that would cover 180,000 acres of the planning area. Management of these ACECs would result in more limitations on ROW development compared to Alternative A. The following ACECs, totaling 107,000 acres, would be managed as ROW avoidance areas:

- Black Mountain/Pistone Archaeological District ACEC
- Grimes Point Archaeological District ACEC
- Incandescent Rocks Scenic ACEC
- Pah Rah High Basin Petroglyph ACEC
- Ruhenstroth Paleontological ACEC
- Tagim aša Cultural ACEC

Direct and indirect impacts from avoiding new renewable energy ROWs under Alternative D would be greater than Alternative A and consistent with those discussed within the *Nature and Types of Effects*.

Effects under Alternative E

Alternative E would manage for three more ACECs than Alternative A for a total of 82,800 acres of ACECs. Management of these ACECs would decrease the potential for future renewable energy development compared to Alternative A, including by eliminating new development potential on 66,800 acres within the following ACECs:

- Fox Peak Cultural ACEC (Job Peak WSA portion only)
- Pah Rah Basin Petroglyph ACEC
- Ruhenstroth Paleontological ACEC
- Stewart Valley Paleontological ACEC

Management of the 2,100-acre Grimes Point Archaeological District ACEC as a ROW avoidance area would reduce the likelihood of new wind, solar, or biomass development within that ACEC boundary.

Direct and indirect impacts from avoiding new renewable energy ROWs under Alternative E would be greater than Alternative A and consistent with those discussed within the *Nature and Types of Effects*.

Renewable Energy: Effects from National Trails Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

There would continue to be no specific management for National Trails under Alternative A and therefore no effects on renewable energy.

Effects under Alternative B

Alternative B would decrease the amount of area available for renewable energy development compared to Alternative A by managing 39,200 acres (0.25 miles on either side) associated with the California NHT and Pony Express NHT as ROW avoidance areas, and an additional 1,000 acres associated with the Pony Express NHT as ROW exclusion areas. Further restrictions on noise could limit the types of renewable energy projects (e.g., wind) permitted within proximity to those trails.

Effects under Alternative C

National Historic Trails management under Alternative C would result in the greatest reduction in area available to renewable energy development by managing 257,400 acres (2.5 miles on either side) associated with the Pony Express and California NHTs as ROW avoidance, and 238,500 acres as ROW exclusion areas. Further restrictions on noise could limit wind energy development within proximity to those trails.

Effects under Alternative D

Effects from NHT management on renewable energy under Alternative D would be the same as Alternative B.

Effects under Alternative E

Alternative E would decrease the amount of area available for renewable energy development compared to Alternative A by managing 172,500 acres (1 mile on either side) associated with the California NHT and Pony Express NHT as ROW avoidance areas, and 25,400 acres as ROW exclusion areas. Further restrictions on noise could limit wind energy development within proximity to those trails.

Renewable Energy: Effects from Wild and Scenic Rivers Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would manage three segments of the East Fork Carson River as eligible for inclusion in the NWSRS; however, because Alternative A would not specify any actions for those WSRs, there would be no impacts on renewable energy.

Effects under Alternative B

Because no river segments would be listed as eligible for inclusion in the NWSRS under Alternative B, there would be no impacts on renewable energy.

Effects under Alternative C

Alternative C would identify three segments of the East Fork Carson River as eligible for inclusion in the NWSRS. Compared to Alternative A, WSR management would decrease the amount of area available for renewable energy development by managing segment 1 as ROW exclusion and segments 2 and 3 as ROW avoidance. Direct and indirect effects from limiting and excluding ROWs include those described within the *Nature and Types of Effects*.

Effects under Alternatives D and E

Effects from WSR management on renewable energy under Alternatives D and E would be the same as Alternative B.

Renewable Energy: Effects from Wilderness Study Areas Management*Effects Common to All Alternatives*

There are no effects common to all alternatives.

Effects under Alternatives A, B, and D

BLM management of WSAs, which protect naturalness and preserve opportunities for solitude and primitive recreation, would exclude those areas from any future renewable energy development. If released from WSA consideration, areas would be open to development.

Effects under Alternatives C and E

The BLM would manage WSAs under Alternatives C and E as ROW exclusion areas with no opportunities for the BLM to accommodate renewable energy demand in those areas. If released from consideration as WSAs, the Carson Iceberg, Clan Alpine, and Desatoya Mountains areas would continue to be managed as ROW exclusion areas with the same effects as those described within the *Nature and Types of Effects*.

Renewable Energy: Effects from Back Country Wildlife Conservation Areas Management*Effects Common to All Alternatives*

There are no effects common to all alternatives.

Effects under Alternative A, B, D, and E

There would be no BCWCAs under Alternatives A, B, D, or E and therefore no effects on renewable energy.

Effects under Alternative C

Under Alternative C, the BLM would manage 17 percent (817,800 acres) of the planning areas as BCWCAs, within which new renewable energy development would be excluded. Compared to Alternative A, excluding new ROWs in BCWCAs under Alternative C would reduce the BLM's ability to accommodate renewable energy demand in those areas and could redirect development to adjacent federal and non-federal areas.

Renewable Energy: Effects from Tribal Interests Management*Effects Common to All Alternatives*

There are no effects common to all alternatives.

Effects under Alternative A, B, and D

There would be no effects from tribal interests on renewable energy under Alternatives A, B, or D. Renewable energy development may impact traditional use areas important to the tribes. The degree of impacts would be dependent on the location of proposals with respect to use areas. In sensitive areas, renewable energy operations would be required to relocate facilities to protect values.

Effects under Alternative C

Alternative C would avoid new ROWs within a 1 mile radius of a burial site, would reduce the ability of the BLM to accommodate future renewable energy demand in those areas.

Effects under Alternative E

Effects on renewable energy from Tribal Interests under Alternative E would be the same as Alternative C.

Renewable Energy: Cumulative Effects

Cumulative impacts on renewable energy are the result of past, present, and reasonably foreseeable future actions within and next to the planning area that increase or decrease the BLM's ability to accommodate demand for wind, solar, and biomass energy development. National- and state-level policies (e.g., Nevada's renewable energy portfolio standard) combined with existing resource potential in the district have and will continue to encourage renewable energy development. Concurrent management of public lands to protect sensitive biological, historical, cultural, and visual resources would continue to limit the locations where development could be occur.

Within the planning area, there are 20,100 acres of superb (Class 7) wind resource areas and an additional 845,900 acres with wind potential of fair to

outstanding (Class 3 to 6). The prospect of profitable wind energy development projects led to 39 applications being received in the planning area since 2002; and while most applications led to testing and monitoring projects, all but three have been allowed to expire by the applicants. Only one utility-scale wind development project has a pending status.

The National Renewable Energy Laboratory data (NREL 2013) shows that 1,365,900 acres of the planning area also have moderate to high potential for solar energy, particularly in the southern portion of the planning area. Since 2002, there have been two applications for solar development. Luning Solar near Hawthorne was issued a ROW grant for a 575-acre project in July, 2010 but construction has not started.

The demand for renewable sources of energy increases may lead to as many as four new wind and solar development projects in the planning area over the next 20 years. Even though demand may be high, areas of high resource potential would continue to be prohibitive for development due to terrain, distance from transmission infrastructure, and costs.

There has traditionally been less interest (compared to wind, solar, and geothermal) in using biomass as an energy source. Fuels treatment projects that would reduce the threat of wild fire and restore sagebrush ecosystems for the Greater Sage-Grouse would increase the supply of pinyon and juniper materials. Where management allows the sale of these woody materials, up to two small-scale biomass facilities could arise.

The incremental effects on renewable energy would vary by alternative due to varying levels of management to protect biological, cultural, and visual resources. In general, Alternatives A and B specify fewer ROW avoidance or exclusion areas to protect sensitive species, wildlife habitats, and cultural resources. Under these alternatives, the potential for renewable energy development would be expected to increase. Alternative C is the most restrictive and would have the greatest potential to incrementally decrease renewable energy development over time. Alternatives D and Alternative E, which take more balanced approaches to resource and resource use management, would have incrementally less effects on wind, solar, and biomass development.

Management strategies and permit requirements, including implementation of mitigation measures and permit stipulations applicable to renewable energy development to protect or reduce impacts on sensitive resources would increase costs. Use restrictions in designated priority wildlife habitat and priority watershed areas to protect those areas would limit renewable energy development. Cumulative impacts on renewable energy development would vary by alternative based on the number of acres designated with use restrictions. Designation of priority wildlife habitat and watersheds, sensitive species management and ACECs would restrict renewable energy development

and the supporting uses (e.g., roads and transmission lines) needed to support development activities thereby affecting the costs and feasibility of projects. These impacts would be limited based on location, habitat conditions, and management discretion in those areas.

Of all the resource programs addressed under Alternatives B through E, Special Status Species has the greatest potential to affect future renewable energy development. Cumulative effects from GRSG conservation measures within the planning area and on BLM-administered lands throughout the Great Basin would have the potential to reduce or eliminate certain types of ROW development. Closures of areas to ROWs could make renewable energy development in the planning area cost prohibitive or impractical.

Geothermal development will also indirectly affect the long-term expansion of wind and solar development in the planning area. The State of Nevada considers the energy produced from geothermal resources as part of its renewable energy portfolio. Compared to wind and solar, geothermal is often preferred by power companies because it offers a more consistent power output, which can be used in conjunction with traditional carbon-based resources (e.g., coal and natural gas) as a base load energy source. Continued exploration and development of geothermal resources in the planning area may indirectly inhibit future wind and solar energy development.

4.5 SPECIAL DESIGNATIONS

This section is a description of the impacts on special designation areas in the planning area and follows the order of topics addressed in **Chapter 2**:

- Areas of Critical Environmental Concern
- Back Country byways
- BCWCAs
- National Trails
- WSRs
- WSAs

4.5.1 Areas of Critical Environmental Concern

ACECs are BLM-administered lands where special management attention is needed to protect the following relevant and important values of the area from irreparable damage: historical, cultural, paleontological, and scenic values, fish and wildlife resources, or other natural processes or systems. This section discusses impacts on potential ACECs and the BLM's ability to protect relevant and important values from proposed management of other resources and resource uses. Existing conditions are described in **Section 3.4.1**, Areas of Critical Environmental Concern.

The BLM held interdisciplinary team meetings to discuss 18 new ACEC nominations and the effectiveness of 6 existing ACECs. The results of those meetings were used in this analysis and are described in the Areas of Critical Environmental Concern Report on the Application of the Relevance and Importance Criteria (BLM 2013b).

Methods of Analysis

Direct impacts on ACECs are considered to be those that either impair or enhance the values for which the ACEC was proposed for designation. As such, relevance and importance criteria were analyzed for each potential ACEC. The BLM also analyzed impacts on these values from either the ACEC designation or where an ACEC is not proposed for designation, the management actions for other resources. All impacts discussed are direct, though some may not occur immediately after implementation of management actions.

The analysis in this section focuses on specific threats to the relevant and important values identified for each ACEC. A nature and type of effects discussion is also included at the beginning of each individual ACEC. Because ACECs are analyzed individually, no summary section is provided for this resource topic.

Assumptions

The following assumptions were used to assess the impacts on ACECs:

- Although management actions for most resources and resource uses have district office-wide application, ACEC management prescriptions will apply only to those lands within each specific ACEC.
- Permitted activities will not be allowed to impair the relevant and important values for which the ACECs are designated. The exception is locatable minerals; until withdrawn from mineral entry, a mining claim can be filed, and subsequent mining could have an impact.
- ACEC designation provides protection and focused management for relevant values beyond that provided through general management of the parent resource (e.g., the cultural resource ACECs will receive greater recognition and protection than the general management action regarding cultural resources; the Endangered Species Act protects threatened and endangered plants, whereas an ACEC for special status plants will offer greater protection of ecosystem processes for plants and focused management).
- Special management prescribed within ACECs is included in other resource and resource use management decisions (e.g., travel restrictions within ACECs are brought forward in travel

management and will be recognized during future travel management planning).

- Any designated ACEC that falls within a WSA will be managed according to BLM Manual 6330, Management of Wilderness Study Areas (BLM 2012e), unless the ACEC management is more restrictive. Because activities within WSAs must meet the nonimpairment criterion, which generally restricts new surface-disturbance, a WSA will generally protect relevant and important values. A WSA also will have a beneficial effect on overlapping potential ACECs. If Congress releases a WSA from further consideration, the special management in designated ACECs will be designed to protect and enhance the relevant and important values.

Indicators

Impacts on ACECs would occur from management actions that would protect or impair relevant and important ACEC values, including “important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes” (BLM Manual 1613, Areas of Critical Environmental Concern [BLM 1988]). The relevant and important values for each proposed ACEC are identified in the Areas of Critical Environmental Concern Report on the Application of the Relevance and Importance Criteria (BLM 2013b).

Black Mountain/Pistone Archaeological District

The Black Mountain/Pistone Archaeological District is a potential 3,400-acre ACEC with identified relevant and important cultural resource values. No immediate threats to this resource have been identified; however, the cumulative impacts from development in the Yerington area and increased use of OHVs for back country exploration greatly increase the potential for the loss of integrity. Because of an increase in drought and accumulation of medium-heavy fuels, wildfire poses a major risk to the resource (e.g., from rock spalling).

Recreation, including travel, within the potential ACEC could impact its values by damaging or destroying the cultural artifacts. Impacts would be reduced where travel is restricted or closed.

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

The potential Black Mountain/Pistone Archaeological District ACEC is not designated. There are few restrictions on OHV use, and cross-country travel is permitted within this area. Unrestricted access to the area could impact the integrity of the site. The impacts of wildfire would continue as described above.

Effects under Alternative B

The potential Black Mountain/Pistone Archaeological District ACEC would be designated (3,400 acres). Travel would be limited to designated routes, which would minimize the risk of damaging or destroying artifacts by keeping motorized and mechanized travel on routes. In addition, surface-disturbing activities would be prohibited within 0.125-mile of the rock art sites in the area, providing additional protection from surface disturbance. Cultural resources would not be a priority for hazardous fuels reduction projects; thus, the risk of wildfire would persist under Alternative B, in a fashion similar to Alternative A.

Effects under Alternative C

The potential Black Mountain/Pistone Archaeological District ACEC would be designated (3,400 acres). The area would be closed to motorized travel, which would minimize the risk of damaging or destroying artifacts by not allowing this type of use. Limiting mechanized travel to designated routes would minimize the risk of damaging or destroying artifacts by keeping this type of travel on routes. In addition, surface-disturbing activities would be prohibited within 1 mile of the rock art sites in the area, providing additional protection from surface disturbance. Alternative C would also emphasize hazardous fuels reduction projects where there were negative impacts of wildfire on cultural resources, among others. This could help minimize fuel buildup that can damage the archaeological resources in the area.

Effects under Alternative D

A portion of the potential Black Mountain/Pistone Archaeological District ACEC would be designated (3,100 acres). However, in the entire potential ACEC (3,400 acres), travel would be limited to designated routes; impacts would be the same as those described under Alternative B. In addition, surface-disturbing activities would be prohibited within 0.125-mile of the rock art sites in the area, resulting in the same impacts as those described under Alternative B. Cultural resources would not be a priority for hazardous fuels reduction projects; thus, the risk of wildfire would persist under Alternative D in a fashion similar to Alternative A.

Effects under Alternative E

The potential Black Mountain/Pistone Archaeological District ACEC would not be designated. However, a portion of the potential ACEC (3,100 acres) would receive specific management associated with the Pistone site to protect the rock art resources. Travel would be limited to designated routes, which would minimize the risk of damaging or destroying artifacts by keep motorized and mechanized travel on routes. In addition, surface-disturbing activities would be prohibited within 0.5-mile of the rock art sites in the area, resulting in the same impacts as those described under Alternative B but over a larger area. Alternative E would also emphasize hazardous fuels reduction projects where there were negative impacts of wildfire on cultural resources, among others. This could help minimize fuel buildup that can damage archaeological resources.

Carson Wandering Skipper

The Carson Wandering Skipper ACEC is currently a designated 330-acre ACEC, with identified relevant and important biological resource values. The area provides habitat for the Carson wandering skipper, a federally endangered butterfly that occupies grassland habitat on alkaline substrate. Major threats to the Carson Wandering Skipper ACEC are livestock grazing, invasive species, ROWs, OHV use, and recreation. Expanding residential and commercial development, which also threatens the ACEC, is discussed under the cumulative analysis.

Livestock grazing can impact Carson Wandering Skipper habitat by removing nectar sources and the larval host plant (*Distichlis spicata*). Livestock trampling can also destroy larvae hibernating during the winter. Invasive species can infest a site to the degree that native species are outcompeted in disturbed areas. Loss of native species reduces nectar sources and the larval host plant. Location of ROWs and recreational OHV use can similarly impact the habitat.

Effects Common to All Alternatives

The highest quality Carson wandering skipper habitat on BLM-administered land is within a portion of the existing ACEC. This area is fenced and would remain so under all alternatives, so the impacts from surface-disturbing activities would be minimal unless the fence was to cease functioning properly.

Having a small population isolated from other populations makes the Carson wandering skippers within and around the ACEC vulnerable to local extinction from random natural or human-caused events.

Under all alternatives, the species would receive some protection via ESA and Section 7 consultation. While actions may be permitted by the BLM and USFWS that “adversely affect” the species, mitigation and conservation measures would be incorporated into any take permit issued by the USFWS in order to reduce the amount of take.

Effects under Alternative A

The Carson Wandering Skipper ACEC (330 acres) would be managed under Alternative A. The area would be managed as available to livestock grazing and ROW location. While the highest quality habitat in the ACEC is fenced from grazing, impacts from ROW development would remove vegetation and disturb important habitat. Implementation of BMPs and mitigation measures would reduce adverse impacts. Impacts described above are possible in the surrounding areas outside of the fenced area. OHV travel is limited to existing routes, which helps minimize impacts of such use.

Fencing around the highest quality habitat helps to minimize spread of invasive species from livestock grazing and OHVs, though invasive species can still spread to these areas and the unfenced areas. Impacts of invasive species are as

described above. Because the area would be managed as an ACEC, this area should be a higher priority for treatment.

The BLM would consider acquisition of lands identified as habitat for the Carson Wandering Skipper within the ACEC boundary. Because the area would be managed as an ACEC, acquisition would be more of a priority in the area. Acquisition of such lands would consolidate ownership of the species' habitat and improve its manageability.

Effects under Alternative B

The potential Carson Wandering Skipper ACEC would not be designated; however, the 330-acre area would not be available for grazing and would be managed as closed to motorized travel. Making the area unavailable for grazing would eliminate its threat to the species on BLM-administered land. Fencing the perimeter of the closed area, which would serve to keep livestock out, would also keep OHVs out and could result in the improvement of habitat beyond what is currently fenced.

Fencing the potential ACEC would help to minimize spread of invasive species from livestock grazing and OHVs, though invasive species can still spread to these areas and the unfenced areas. Impacts of invasive species would be as described above. Because the ACEC would not be designated, this area may be a lower priority for treatment.

The area would be open to ROW location; impacts would be the same as under Alternative A.

The potential ACEC would be within the proposed Reno Urban Interface ERMA. While recreation may be highlighted in the ERMA, it is more likely that recreation would be monitored in the area, as opposed to areas not designated as recreation management areas; thus, recreational impacts on the species could be identified and mitigated earlier on.

Because the ACEC would not be designated under Alternative B, it is likely that acquisition of lands with identified Carson Wandering Skipper habitat would be less of a priority than under Alternative A.

Effects under Alternative C

The potential Carson Wandering Skipper ACEC would be designated (330 acres). It would not be available for grazing and would be closed to motorized travel and fluid mineral leasing, resulting in impacts similar to those described under Alternative B. The ACEC would also be managed as a ROW exclusion area, eliminating the threat of habitat loss and species mortality. The impacts of invasive species would be similar to those described under Alternative A but over a larger area as the whole ACEC would exclude grazing, and OHVs reducing the potential establishment and spread of invasive plants.

The ACEC would be within the proposed Reno Urban Interface ERMA. Recreational impacts would be similar to those described under Alternative B.

The BLM would consider acquisition of lands identified as habitat for the Carson Wandering Skipper. Impacts would be the same as described under Alternative A.

Effects under Alternative D

The potential Carson Wandering Skipper ACEC would not be designated. Impacts would be similar to those described under Alternative B, except that the ACEC would also overlap a ROW avoidance area. ROWs could be developed in the area under certain conditions. For this reason, development activities and placement of facilities would take into account the species' needs at the project level in order to minimize impacts.

The potential ACEC would be within the proposed Reno Urban Interface ERMA. Recreational impacts would be the same as those described under Alternative B.

Effects under Alternative E

The potential Carson Wandering Skipper ACEC would not be designated; however, the 330-acre area would not be available for grazing, reducing the threat of habitat loss and species mortality from livestock grazing. This could result in the improvement of additional habitat outside of the already fenced area. Impacts from invasive species would be similar to those described for Alternative A but over a larger area as the whole potential ACEC would be fenced. Because the ACEC would not be designated, this area may be a lower priority for treatment.

The area would also overlap a ROW avoidance area. ROW development could occur in the area under certain conditions. For this reason, development activities and placement of facilities would take into account the species' needs at the project level in order to minimize impacts. Travel management planning would limit vehicle travel to designated routes within the potential ACEC and no new routes would be authorized. By restricting travel to existing routes and not constructing new routes, trampling of skipper larvae or their habitat should be eliminated.

The potential ACEC would be within the proposed Reno Urban Interface ERMA. Recreational impacts would be the same as those described under Alternative B.

Churchill Narrows Buckwheat Botanical

This area is a potential 6,600-acre ACEC, with identified relevant and important biological resource values. It provides habitat for the Churchill Narrows buckwheat (*Eriogonum diatomaceum*), an endemic plant. The USFWS identified it as a candidate species, the State of Nevada listed it as critically endangered, and

the BLM designated it a special status species. Major threats to the Churchill Narrows Buckwheat Botanical Potential ACEC are mining (locatable minerals and mineral materials), livestock grazing, invasive species spread, and OHV use.

Livestock grazing infrastructure and improper livestock grazing could damage the relevant and important values by consuming or damaging the Churchill Narrows buckwheat, compacting soils, and destroying important microtopography that influences water movement and precipitation accumulation. Livestock can also introduce and spread invasive species, which could out-compete the buckwheat and provide a source of fine fuel, which may lead to destructive fire within the habitat. OHV use can similarly impact the buckwheat.

Mineral development could impact ACEC values by removing diatomaceous earth upon which the plant depends; flattening, destroying, or removing the buckwheat; or by spreading weeds. Mining would also result in soil compaction, changing the microtopography. The microtopography influences soil formation processes and soil saturation, which affect the plant's ability to survive. Closures to mineral materials disposal within the potential ACEC would help protect the buckwheat by eliminating surface-disturbance associated with mineral development.

Petitioning to withdraw the area from locatable mineral entry would help protect the buckwheat if the area is formally withdrawn. Withdrawal would limit the impacts of locatable minerals development on the withdrawn portions of the ACEC. Specific impacts of locatable minerals development on Churchill Narrows buckwheat are of the same nature and type as impacts of mineral material development.

OHV use could impact ACEC values by disturbing soils and removing diatomaceous earth upon which the plant depends; flattening, destroying, or removing the buckwheat; or by spreading weeds. Restricting motorized travel within the potential ACEC would help protect the buckwheat by eliminating surface-disturbance.

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

The potential Churchill Narrows Buckwheat Botanical ACEC is not designated. The area would be available for grazing and open to mineral material disposal, locatable mineral entry, and cross-country travel. Impacts as described above could be experienced throughout the potential ACEC.

Effects under Alternative B

The entire 6,600 acres of the potential Churchill Narrows Buckwheat Botanical ACEC would be designated. Approximately 3,600 acres would overlap the

Namazii Wunu Cultural ACEC. The area would be available for livestock grazing and open to mineral material disposal, and locatable mineral entry. Impacts of such development would be the same as under Alternative A. However, because the ACEC would be designated under this alternative, the BLM would likely monitor the area more than under nondesignation (Alternative A); thus, impacts could be caught and mitigated earlier. Travel would be limited to designated routes, which would minimize the risk of damaging or destroying the buckwheat by keeping motorized and mechanized travel on routes.

Effects under Alternative C

The entire 6,600-acre potential Churchill Narrows Buckwheat Botanical ACEC would be designated. Approximately 3,600 acres would overlap the Namazii Wunu Cultural ACEC. The Churchill Narrows Buckwheat Botanical ACEC would be closed to motorized and mechanized travel and mineral material disposal. This would eliminate potential impacts from these uses.

The portion of the ACEC that overlaps the Namazii Wunu Cultural ACEC would be unavailable to livestock grazing, thereby reducing potential impacts from livestock grazing in the area. The remaining portion of the ACEC would be available for livestock grazing; impacts in this area would be the same as under Alternative A. However, because the ACEC would be designated under this alternative, the BLM would likely monitor the area more than under nondesignation (Alternative A); thus, impacts could be caught and mitigated earlier. The ACEC would also be open for locatable mineral entry; impacts would be the same as described for Alternative B.

Under Alternative C, a portion of the ACEC (1,800 acres) would overlap the Singatse ERMA. Dispersed motorized opportunities would be highlighted in the ERMA; however, because the ACEC would be closed to motorized travel, OHV recreation in the ACEC is unlikely to impact the buckwheat in the area of overlap.

Effects under Alternative D

The entire 6,600-acre potential Churchill Narrows Buckwheat Botanical ACEC would be designated. Management for the ACEC would be the same as under Alternative B, so impacts would also be the same.

Effects under Alternative E

The entire 6,600-acre potential Churchill Narrows Buckwheat Botanical ACEC would be designated. The area would be available for livestock grazing and 5,300 acres would be open to mineral material disposal. 1,300 acres of the ACEC would be closed to mineral material disposal due to overlap with the California National Historic Trail. Impacts of such development would be the same as described under Alternative A. However, because the ACEC would be designated under this alternative, the BLM would likely monitor the area more than under nondesignation (Alternative A); thus, impacts could be caught and mitigated earlier. The ACEC would be proposed for withdrawal from locatable

mineral entry. Withdrawal would limit the impacts of locatable minerals development.

Travel would be limited to designated routes which would minimize the risk of damaging or destroying the buckwheat by keeping motorized and mechanized travel on routes.

An 1,800-acre portion of the ACEC would overlap the Singatse ERMA. Management within this overlap would complement management within the Singatse ERMA. In cases where there may be conflicting management objectives, the ACEC management would take precedence over ERMA management. Recreation may be highlighted in the ERMA; however, it is more likely that recreation would be monitored in the area, as opposed to areas not designated as recreation management areas. Therefore, recreational impacts on the buckwheat could be identified and mitigated earlier.

Clan Alpine Greater Sage-Grouse, Desatoya Greater Sage-Grouse, Virginia Mountain Greater Sage-Grouse, and Pine Nut Bi-State Sage Grouse

These are potential ACECs with identified relevant and important biological resource values. The potential ACECs for Greater Sage-Grouse (Clan Alpine [98,400 acres], Desatoya [105,100 acres], and Virginia Mountain [109,200 acres]), a candidate for listing under the ESA, are within PPMAs that provide lekking, nesting, brood-rearing, and/or wintering habitat for the species. The Pine Nut Bi-State Sage Grouse potential ACEC (100,400 acres) provides summer and winter habitat for breeding and brood rearing for the bi-state sage grouse, a species proposed for listing under the ESA as threatened. Major threats to the potential ACECs are conifer encroachment into sagebrush or riparian habitats, wildfire, grazing, OHV use, invasive species, infrastructure, geothermal development, and urbanization (see chart below for specifics).

Threat	Clan Alpine Greater Sage-Grouse	Desatoya Greater Sage-Grouse	Virginia Mountain Greater Sage-Grouse	Pine Nut Bi-state Sage Grouse
Conifer encroachment	✓	✓	✓	✓
Wildfire	✓	✓	✓	✓
Grazing	✓	✓	✓	✓
Invasive species	✓	✓	✓	✓
Infrastructure			✓	
Geothermal development			✓	
Urbanization			✓	
OHV use				✓

Because the potential ACECs for Sage-Grouse cover their habitat area and not smaller areas within the habitat area, impacts are the same as those described in

Section 4.3.6, Special Status Species. No separate analysis is included here. The exception is that the potential Clan Alpine Greater Sage-Grouse ACECs would be recommended for withdrawal under Alternative C and the potential Pine Nut Bi-state Sage Grouse and Virginia Mountain Greater Sage-Grouse ACECs would be recommended for withdrawal within 3.25 miles of active leks in the ACECs. If the withdrawals were processed, it would limit the impact of locatable mineral development on sage-grouse habitat. This would be particularly important in the potential Virginia Mountain Greater Sage-Grouse ACEC, where infrastructure and urbanization are threats to the species.

Dixie Valley Toad

The Dixie Valley Toad is a potential 410-acre ACEC with identified relevant and important biological resource values. The area provides habitat for the Dixie Valley toad, a subspecies of western toad (*Anaxyrus boreas boreas*). It is listed by the State of Nevada as S2 (imperiled due to rarity or other demonstrable factors) and is listed by the BLM as sensitive.

Monitoring data does not indicate that the subspecies is undergoing any population or habitat stresses that would threaten it. Recent NDOW, Navy, BLM, and USFWS surveys over the last three to four years indicate a thriving and healthy population. As long as the spring supplying water to the meadow remains and the breeding areas are intact, the population should remain viable. The spring is on Navy-owned land next to the meadows; the breeding habitat is on BLM-administered lands. The ponds in the northern part of the area are not natural since they were created by placing dykes, but the springs represent a rare perennial water source on a desert playa. The toad breeds in the northern and southern part of the potential ACEC. Egg masses are laid in shallow (a few inches) of water covering up salt grass.

Challenges presented for managing the area include mixed land ownership, existing ROWs, split-estate mineral rights, and patented lands.

Effects Common to All Alternatives

A transmission line and roads associated with geothermal leases are within and next to the potential ACEC. The infrastructure associated with the geothermal activity does not appear to be affecting the species' habitat. However, if additional developments damage the meadows where the species breeds or the spring source is compromised, the species could be affected.

Effects under Alternative A

Lands within the potential ACEC boundary would be open to fluid mineral leasing and ROW location, so geophysical exploration is occurring. If new leases are purchased and developed, the habitat could be damaged where the species Dixie Valley Toad breeds.

Effects under Alternative B

The potential Dixie Valley Toad ACEC would not be designated. Management would be similar to that under Alternative A, so impacts also would be similar. Approximately 200 acres of the potential ACEC would be covered by a CSU stipulation for fluid mineral leases. This would allow fluid mineral leasing, with certain operational or locational constraints imposed by the BLM. The CSU stipulation relies on project design, siting, and implementation of appropriate mitigation measures and monitoring protocols to ensure that resources are adequately safeguarded. Application of the CSU stipulation across a portion of the potential ACEC would mitigate impacts from fluid mineral development. However, the stipulation would not be targeted to protect the Dixie Valley toad. If the BLM Authorized Officer were to except, modify, or waive the restriction, impacts could occur.

Effects under Alternative C

The potential Dixie Valley Toad ACEC (410 acres) would be designated. It would be open to fluid mineral leasing but would be covered by an NSO stipulation. The stipulation would require that surface occupancy be located outside of the ACEC area, so the breeding habitat would be protected from potential new energy development. The ACEC would also be a ROW exclusion area, so no new ROWs could be developed. This would eliminate the potential for impacts from new ROW location. Compared to Alternative A, designating the ACEC under this alternative would provide the most protection to the Dixie Valley toad and its habitat.

Effects under Alternative D

The potential Dixie Valley Toad ACEC would not be designated. Management would be similar to Alternative B, so impacts also would be similar. However, under Alternative D, approximately 29 percent of the potential ACEC would overlap a ROW avoidance area. ROWs could be developed in the area under certain conditions; however, development activities and placement of facilities should take into account the species' needs at the project level to minimize impacts.

Effects under Alternative E

The potential Dixie Valley Toad ACEC would not be designated. Management would be similar to that under Alternative B, so impacts also would be similar. However, under Alternative E, approximately 29 percent of the potential ACEC would overlap a ROW avoidance area. ROWs could be developed in the area under certain conditions; however, development activities and placement of facilities should take into account the species' needs at the project level to minimize impacts. In addition, approximately half of the potential ACEC would be covered by an NSO stipulation for fluid mineral leasing. The stipulation would protect the Dixie Valley toad habitat by precluding surface occupancy in the area of overlap; however, the stipulation would not be targeted to protect

the Dixie Valley toad. If the BLM Authorized Officer were to except, modify, or waive the restriction, impacts could occur.

Fox Peak Cultural

Fox Peak Cultural is a potential 49,000-acre ACEC with identified relevant and important cultural resources for its significance to local tribes. Mining and ROWs may pose a threat to the visual landscape and setting in the future; however, currently the area is not identified as suitable for transmission lines, nor does it display suitable material for mineral extraction. Limited recreation does not pose a significant threat.

Effects Common to All Alternatives

A 43,300-acre portion of the potential Fox Peak Cultural ACEC overlaps the Job Peak WSA. This WSA is managed as VRM Class I and would be closed to new permanent disturbances that do not meet the nonimpairment standard. As long as the WSA exists, it is unlikely that the relevant and important values would be impacted in the area of overlap, which is 88 percent of the potential ACEC.

Effects under Alternative A

The potential Fox Peak Cultural ACEC is not designated. Outside of the WSA overlap, the area would be open to fluid mineral leasing, mineral material disposal, nonenergy mineral leasing, and ROW location. If these activities are permitted, cultural resources could be potentially damaged. However, requirements under the NHPA Section 106 process and implementation of site-specific mitigation measures would reduce impact potential. The area's significance for traditional purposes would also be affected. The area outside of the WSA also does not have a VRM class assigned to it. Impacts on visual settings would be analyzed under site-specific NEPA planning. Site-specific mitigation measures would be developed to reduce visual impacts. Impacts on the sacred or religious traditional use areas would be dependent on the type of use proposed and project size.

Effects under Alternative B

A 48,400-acre portion of the potential Fox Peak Cultural ACEC would be designated, and 600 acres would not be designated. Outside of the WSA overlap, the area would be open to fluid mineral leasing, subject either to an NSO or CSU stipulation. The NSO stipulation would protect the cultural value by precluding surface occupancy in the area of overlap. The CSU stipulation relies on project design, siting, and implementation of appropriate mitigation measures and monitoring protocols. This is to ensure that resources are adequately safeguarded. Application of the CSU stipulation across a portion of the potential ACEC would mitigate impacts from fluid mineral development, but the stipulation would not eliminate all impacts. In both cases with the NSO and CSU, the stipulations would not be targeted to protect the cultural resource

value. If the BLM Authorized Officer were to except, modify, or waive the restriction, impacts could occur.

The area outside of the WSA overlap would also be mostly closed to mineral material disposal and nonenergy mineral leasing. The BLM would continue to manage 25 acres as open to mineral material disposal and nonenergy leasable minerals. Impacts would be similar to Alternative A, except that fewer acres would be available for disturbance.

Outside of the WSA, 5,700 acres would overlap a ROW avoidance area. ROW development could occur in the area under certain conditions; however, development activities and placement of facilities should take into account the cultural resources at the project level to minimize impacts.

Outside of the WSA, the ACEC, including the 600 acres that would not be designated under Alternative B, would be managed as VRM Class IV. Major modifications to the landscape could be allowed; because of this, it is possible for activities to be permitted that would affect the visual quality of the area and, in turn, impact the sacred or religious traditional use of the identified resources.

Effects under Alternative C

A 48,400-acre portion of the potential Fox Peak Cultural ACEC would be designated; 600 acres would not be designated. Outside the WSA and lands with wilderness characteristics overlaps, 900 acres would be open to fluid mineral leasing, and 4,900 acres would be closed. Of the 900 acres open to fluid mineral leasing, 100 would be subject to CSU stipulations. Impacts would be similar as described under Alternative B for the area of overlap, except that more acres would be closed to disturbance.

Only 4,900 acres of the ACEC outside the WSA overlap would be closed to mineral material disposal and nonenergy mineral leasing. This would leave the remaining 900 acres open to such activity. Impacts would be the same as under Alternative A if these activities were permitted in the open areas.

Outside the WSA, 4,200 acres would overlap a ROW exclusion area. This would preclude impacts from ROW development in the area. Also outside the WSA, the ACEC, including the 600 acres that would not be designated under this alternative, would be managed as VRM Class I and II. This would allow low levels of landscape modifications in order to retain the existing character of the landscape. It also would help maintain the scenic integrity of the area by not allowing development that does not meet the VRM Class II objective, such as aboveground mining activities. In this way, viewsheds for traditional uses would be protected from most surface-disturbing activities.

Effects under Alternative D

A 48,400-acre portion of the potential Fox Peak Cultural ACEC would be designated; 600 acres would not be designated. Outside of the WSA, the ACEC

(including the 600 acres that would be undesignated under this alternative) would be open for fluid mineral leasing. Approximately 4,000 acres would be subject to an NSO stipulation, and 3,700 acres would be subject to a CSU stipulation. Impacts would be the same as described under Alternative B for the area of overlap.

Outside the WSA, the potential ACEC (including the 600 acres that would be undesignated under this alternative) would be closed to mineral material disposal and nonenergy mineral leasing. This would limit permitted activities within the ACEC.

Also outside the WSA, approximately 5,700 acres would overlap a ROW avoidance area. ROW development could occur in the area under certain conditions; however, development activities and placement of facilities would take into account the cultural resources at the project level to minimize impacts.

Outside the WSA, the ACEC, including the 600 acres that would not be designated under this alternative, would be managed as VRM Class IV; impacts would be the same as those described under Alternative B.

Effects under Alternative E

The entire potential Fox Peak Cultural ACEC would be designated (49,000 acres). It would be closed to fluid mineral leasing, would be either a ROW avoidance or exclusion area, and would be proposed for withdrawal from locatable mineral entry. These actions would limit impacts on the cultural resources and setting of the area.

Also, outside the WSA, the ACEC would be closed to mineral material disposal and nonenergy mineral leasing. In addition, the area would be managed as VRM Class II. It is unlikely that new development could occur that would meet VRM Class II objectives. The impacts of VRM Class II management are the same as those described under Alternative C.

Greater Sand Mountain ACEC and Sand Springs Desert Study Area ACEC

Greater Sand Mountain is a potential 17,000-acre ACEC with identified relevant and important cultural and biological resource values. Within the proposed ACEC, approximately 104 archaeological sites have been recorded. Of these, approximately 60 have been evaluated as eligible for inclusion on the NRHP. Historic use of the Sand Mountain area includes Sand Springs Pony Express Station, an overland stage stop, an ore processing mill, and a post office. The Fallon Paiute-Shoshone Tribe considers Sand Mountain a sacred site. The area is also a complex ecological system that represents a rare, sensitive, and fragile environment of dune flora and fauna; 28 rare and endemic species are unique to Sand Mountain. The sand dunes provide habitat for the Kearny buckwheat (*Eriogonum nummulari*); this is the host plant for the Sand Mountain blue butterfly (*Euphilotes pallescens arenamontana*), a BLM sensitive species endemic

to Sand Mountain. Major threats to the potential ACEC are livestock grazing, looting, OHV use, locatable mineral mining, mineral material disposal, erosion, and invasive species.

Sand Springs Desert Study Area is a potential 50-acre ACEC with identified relevant and important cultural values. The Sand Springs Pony Express Station, one of the few remaining rock walled structures, is located within the study area. Major threats to the potential ACEC are erosion, looting, and vandalism.

Livestock can trample and damage the butterfly habitat, furthering its fragmentation. Closing the area to livestock grazing would eliminate the potential threats from livestock.

Intensive OHV travel has led to both habitat fragmentation and loss of habitat for the blue butterfly where Kearny buckwheat plants have been trampled or removed. These pathways also serve as corridors for the spread of invasive species, which can further reduce the habitat needed by the butterfly. Closing areas to motorized travel, the primary mode of transportation in the area, can minimize impacts from this type of use and help promote the recovery of native vegetation, including the Kearny buckwheat, the host plant for the butterfly.

OHV use can also damage archaeological artifacts and can be disruptive to traditional religious and sacred uses by the Fallon Paiute-Shoshone Tribe. OHV use also exacerbates erosion in the area. Erosion can damage cultural artifacts by covering, exposing, or eroding the resources themselves.

Locatable mineral development could impact ACEC values by flattening, destroying, or removing vegetation, desired plant communities, and special status plant species; changing the visual landscape; degrading and fragmenting habitat; disturbing wildlife; spreading weeds; and damaging cultural resources during road and facility construction. Petitioning to withdraw areas from locatable mineral entry could help protect cultural resource values if they are formally withdrawn. Withdrawal would limit the impacts of locatable minerals development on the portions of the ACEC that were withdrawn.

Effects Common to All Alternatives

Sand Springs Pony Express Station is listed on the NRHP.

Effects under Alternative A

Neither the potential Greater Sand Mountain nor the potential Sand Springs Desert Study Area ACECs are designated. The area, which encompasses Sand Springs Desert Study Area, is available for livestock grazing and mineral material disposal. Impacts would continue as described above.

Approximately 5,800 acres of the Greater Sand Mountain potential ACEC (including all of Sand Springs Desert Study Area) would be closed to motorized travel. This helps prevent damage to and fragmentation of the blue butterfly

habitat. In the same way, it benefits biological species and the cultural resources surrounding and including the Pony Express Station. In turn, the spread of invasive species in the closed area would be minimized. The remaining 11,200 acres of the Greater Sand Mountain potential ACEC would be open to cross-country travel. As previously described, cross-country travel can increase the rate of erosion over a larger area, damaging cultural and biological resources. Where native vegetation is trampled or removed, invasive species can spread more quickly.

Approximately 2,760 acres within the Sand Mountain Recreation Area (including all of the Sand Springs Desert Study Area) are segregated under the Classification and Multiple Purposes Act of 1964. The segregation includes segregation from locatable mineral entry, which helps protect the cultural and biological resources from fragmentation and damage associated with locatable mineral development.

Effects under Alternative B

The 17,000-acre potential Greater Sand Mountain ACEC would be designated. The potential Sand Springs Desert Study Area ACEC would not be designated, because it falls entirely within the Greater Sand Mountain ACEC. This ACEC would be available for livestock grazing, and 2,500 acres would be open to mineral material disposal; impacts would be similar to those described under *Effects Common to All Alternatives*.

Under Alternative B, 2,600 acres of the Greater Sand Mountain ACEC (including all of the Sand Springs Desert Study Area potential ACEC) would overlap an area that would be closed to motorized and mechanized travel. In this area, impacts on both the biological and cultural resources would be protected from damage or destruction as described above. An additional 2,600 acres of the Greater Sand Mountain ACEC would be closed to motorized travel; impacts would be the same as described under Alternative A on the 5,800 acres. Furthermore, 10,500 acres of the ACEC would overlap an area where motorized and mechanized travel would be limited to designated routes. Limiting travel to designated routes can minimize the spread of invasive species, trampling or removal of vegetation, and damage of cultural resources. The remaining 1,300 acres of unvegetated dune area within the ACEC would be open to cross-country travel. Impacts would be the same as described under Alternative A in this area.

The Greater Sand Mountain ACEC and the Sand Springs Desert Study Area potential ACEC would be proposed for withdrawal from locatable mineral entry under Alternative B. This would result in 16,400 acres in the Greater Sand Mountain ACEC and 17,000 acres in the Sand Springs Desert Study Area being closed to locatable mineral entry. Locatable mineral development would not occur and the impacts described above would not occur.

Approximately 12,000 acres of the Greater Sand Mountain ACEC would overlap the Salt Wells ERMA and 5,000 acres (including all of the Sand Springs Desert Study Area potential ACEC) would overlap the Sand Mountain SRMA. SRMA management that would impact the ACEC values primarily relates to travel designations (i.e., open, limited, or closed) and are previously discussed in this section. The ERMA would primarily promote long-distance trail riding opportunities on designated routes, which would be compatible with management of the Greater Sand Mountain ACEC. While recreation may be highlighted and concentrated in the area, it is more likely that recreation would be monitored in the area, as opposed to areas not designated as recreation management areas, and so impacts could be identified and mitigated earlier on.

Effects under Alternative C

The 17,000-acre potential Greater Sand Mountain ACEC and the 50-acre potential Sand Springs Desert Study Area ACEC would be designated. The Sand Springs Desert Study Area ACEC would be entirely within the Greater Sand Mountain ACEC.

The Greater Sand Mountain ACEC would not be available for livestock grazing, and 14,500 acres would overlap an area closed to mineral material disposal. This would reduce the potential for the impacts described above, compared with Alternative A.

Under Alternative C, the Sand Springs Desert Study Area ACEC would be closed to motorized and mechanized travel. In this area, impacts on the cultural resources would be protected from damage or destruction, as described above. Approximately 11,600 acres of the Greater Sand Mountain ACEC (overlapping the Sand Mountain SRMA, Desert Habitat RMZ) would be closed to motorized travel; impacts would be the same as described under Alternative A. The remaining 1,300 acres of the ACEC (overlapping the Sand Mountain SRMA, Dune RMZ) would be open to cross-country travel. Impacts would be the same as described under Alternative A.

Both the Greater Sand Mountain and the Sand Springs Desert Study Area ACECs would be proposed for withdrawal from locatable mineral entry under Alternative C. This withdrawal, if processed, would help protect the cultural and biological resources from fragmentation and damage associated with locatable mineral development.

Approximately 4,900 acres of the Greater Sand Mountain ACEC would overlap the Salt Wells ERMA; 4,000 acres (including all of the Sand Springs Desert Study Area potential ACEC) would overlap the Sand Mountain SRMA. Impacts would be similar to those described under Alternative B.

Effects under Alternative D

Neither the potential Greater Sand Mountain nor the potential Sand Springs Desert Study Area ACECs would be designated. The Greater Sand Mountain

ACEC would be available for livestock grazing and 600 acres would be open to mineral material disposal. Impacts would be the same as Alternative B.

Under Alternative D, 5,800 acres of the Greater Sand Mountain potential ACEC (including all of the Sand Springs Desert Study Area potential ACEC) would overlap an area that would be closed to motorized travel; impacts would be the same as described under Alternative A. Motorized and mechanized travel in the remaining, 11,200 acres of the ACEC would overlap an area where motorized and mechanized travel would be limited to designated routes. This can minimize the spread of invasive species, trampling or removal of vegetation, and damage to cultural resources.

The Greater Sand Mountain ACEC and the Sand Springs Desert Study Area potential ACEC would be proposed for withdrawal from locatable mineral entry. Impacts would be the same as described under Alternative B.

Effects under Alternative E

Neither the potential Greater Sand Mountain nor the potential Sand Springs Desert Study Area ACECs would be designated. The potential Greater Sand Mountain ACEC would be available for livestock grazing and 400 acres would be open to mineral material disposal. Impacts would generally be the same as Alternative B.

Under Alternative E, 2,600 acres of the potential Greater Sand Mountain ACEC (including all of the potential Sand Springs Desert Study Area ACEC) would overlap an area that would be closed to motorized and mechanized travel. Impacts would be the same as described for Alternative B. An additional 2,600 acres of the potential Greater Sand Mountain ACEC would overlap an area that would be closed to motorized travel. Impacts would be the same as described under Alternative A. Furthermore, 10,500 acres of the potential ACEC would overlap an area where motorized and mechanized travel would be limited to designated routes. Impacts would be the same as described under Alternative B but over a greater area. The remaining 1,300 acres of the potential ACEC would be open to cross-country travel. Impacts would be the same as described under Alternative A.

Approximately 16,400 acres within the potential Sand Springs Desert Study Area ACEC overlap an area that would be proposed for withdrawal from locatable mineral entry. This withdrawal, if processed, would help protect the cultural resources from damage associated with locatable mineral development.

Approximately 5,000 acres of the potential Greater Sand Mountain ACEC would overlap the Salt Wells ERMA, and 12,000 acres (including all of the Sand Springs Desert Study Area potential ACEC) would overlap the Sand Mountain SRMA. Impacts would be similar to those described under Alternative B.

Grimes Point Archaeological District

Grimes Point Archaeological District is a potential 15,900-acre ACEC with identified relevant and important cultural resource values. Major threats to the potential ACEC are OHV use, mineral material extraction/exploration, mining, ROWs, vandalism, target shooting, erosion, trash accumulation, soil deposition, looting, and livestock grazing. Urbanization (e.g., human encroachment and increased use of public lands), which also threatens the potential ACEC, is discussed under Cumulative Effects.

Surface-disturbing activities, including OHV use, mining, and ROW location, and trampling due to livestock grazing, can all damage or destroy archaeological and paleontological artifacts on the surface. Livestock can also rub against petroglyphs, causing them to fade away over time. OHV use can also cause erosion that can damage artifacts by covering them, by exposing them, or by eroding the resources themselves.

Energy and minerals development could impact ACEC values by flattening, destroying, or removing vegetation; changing the visual landscape; causing erosion that could degrade resources by changing them (e.g., wearing them away or eroding them) or covering them up. Erosion can also lead to new resources coming to the surface and being discovered and damaging cultural or geologic resources during road and facility construction. Closures to mineral materials disposal would help protect ACEC values by eliminating surface-disturbance associated with such development.

Petitioning to withdraw areas from locatable mineral entry within potential ACECs could help protect ACEC values if they are formally withdrawn. Withdrawal would limit the impacts of locatable minerals development on ACEC values within the portions of ACECs that were withdrawn. Specific impacts of locatable minerals development on ACEC values are of the same nature and type as impacts of general energy and minerals development.

Identifying ACECs as ROW exclusion or avoidance areas would protect relevant and important values by reducing (for avoidance areas) or eliminating (for exclusion areas) impacts from development requiring a ROW permit, including for utilities and access roads.

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

The potential Grimes Point Archaeological District ACEC is not designated. Lands within this area are open to multiple uses that have the potential to damage resources, as described above. While the area is designated as an archaeological district, only a portion is listed on the NRHP. The potential ACEC would be open to mineral material disposal, nonenergy mineral leasing, and locatable mineral entry. These types of activities could result in the impacts

described above. The ACEC is also open to fluid mineral leasing, and 615 acres has an NSO stipulation. This would prevent surface disturbance in the NSO area, but operations could be moved (on the lease) to other portions of the potential ACEC; this would have impacts.

Approximately 13,800 acres of the potential ACEC would be open to cross-country travel and is causing the impacts described above. Only 2,100 acres (13 percent) would be closed to motorized travel. This closure precludes damage and destruction from OHV use, but similar impacts could be realized from nonmotorized recreation in the same area.

Effects under Alternative B

The potential Grimes Point Archaeological District ACEC (15,900 acres) would be designated. The ACEC would be open to fluid mineral leasing. This would be subject to an NSO stipulation to protect resources at the surface by not allowing fluid mineral development. The ACEC would also be open to nonenergy mineral leasing and livestock grazing, impacts of which would be the same as under Alternative A.

Cultural and historic values of rock art sites would be protected by prohibiting surface-disturbing activities and visual intrusions within 0.125 mile of these areas. This would be the case if they were to adversely affect these values during evaluation of eligibility for the NRHP.

Both motorized and mechanized travel would be limited to designated routes. Limiting travel to designated routes can minimize damage to artifacts on the surface by keeping recreationists away from them.

The ACEC would be managed as ROW avoidance. ROW development could occur in the area under certain conditions; even so, development activities and facilities placement should take into account the cultural resources at the project level in order to minimize impacts.

Finally, the ACEC would be entirely within the Salt Wells ERMA. The ERMA would primarily promote long-distance trail riding opportunities which would be compatible with management of the Grimes Point Archaeological District ACEC. While recreation may be highlighted in the ERMA, it is more likely that recreation would be monitored in the area, as opposed to areas not designated as recreation management areas. Thus, impacts could be identified and mitigated earlier.

Effects under Alternative C

The potential Grimes Point Archaeological District ACEC (15,900 acres) would be designated. The ACEC would overlap an area closed to fluid mineral leasing and portions of the ACEC would overlap with areas that would be closed to mineral material disposal (3,600 acres) and nonenergy mineral leasing (3,400 acres). These closures would protect visual integrity and artifacts from direct

damage in the closed areas. The entire ACEC would also be proposed for withdrawal from locatable mineral entry which, if withdrawn, would also provide protections from this type of development.

An 11,600-acre portion of the ACEC would be managed as ROW avoidance, with the same impacts as under Alternative B. The remaining 4,300 acres would overlap a ROW exclusion area, which would preclude impacts from ROW development.

Approximately 2,100 acres of the ACEC would not be available for livestock grazing to protect ACEC values; an additional 12,400 acres would overlap an area that is also not available for livestock grazing. Fencing or other enclosures may have to be constructed to keep cows out of the unavailable area; fence construction could cause local damage to artifacts. However, closing most of the ACEC to livestock grazing would protect the archaeological and paleontological values.

Cultural and historic values of rock art sites would be protected by prohibiting surface-disturbing activities and visual intrusions within 1 mile of these areas if they would adversely affect these values during their evaluation of eligibility for the NRHP.

The ACEC would be closed to motorized and mechanized travel, which would prevent damage or destruction from this type of recreation. Also, closure to motorized and mechanized travel would likely result in fewer people accessing the area. This would likely reduce the level of vandalism and looting that is occurring.

The 14,900 acres of the ACEC would be within the Salt Wells ERMA. Recreation that adversely impacts cultural or historic resources would not be authorized, providing additional protection from recreation requiring a permit. Because the ACEC would be closed to motorized and mechanized travel, impacts from recreation in general would be minimal.

Effects under Alternative D

The potential Grimes Point Archaeological District ACEC (15,900 acres) would be designated. Management would be the same as described for Alternative B, except that the area would not overlap the Salt Wells ERMA.

Effects under Alternative E

Only a 2,100-acre portion of the potential Grimes Point Archaeological District ACEC would be designated; the entire 15,900-acre potential ACEC would be within the Wyemaha Archaeological District. Management for the Wyemaha Archaeological District, including proposed withdrawal from locatable mineral entry, closed to fluid mineral leasing, and ROW avoidance (12,300 acres) and exclusion (3,600 acres), would all provide protections to the ACEC values.

Cultural and historic values of rock art sites would be protected by prohibiting surface-disturbing activities and visual intrusions within 0.5 mile (or the visual horizon) of these areas if they would adversely affect these values during their evaluation of eligibility for the NRHP.

The ACEC would be entirely within the Salt Wells ERMA; impacts would be the same as under Alternative B.

Incandescent Rocks Scenic

Incandescent Rocks Scenic is a potential 1,100-acre ACEC with identified relevant and important scenic values. The significance of the site centers on the rhyolitic outcrops and ridges that are characterized by red, yellow, orange, and purple hues that appear to glow as light reflects off them. Major threats are OHV use, mineral exploration, vandalism, and erosion.

Effects Common to All Alternatives

Under all alternatives, the ACEC would be managed as VRM Class II, which would allow low levels of landscape modifications in order to retain the scenic value. This would help maintain the scenic value in the area.

Effects under Alternative A

The Incandescent Rocks Scenic ACEC (1,100 acres) would be designated. It would be managed as open to fluid mineral leasing, mineral material disposal, nonenergy mineral leasing, locatable mineral entry, and ROW development. However, all of these activities, if permitted, would have to meet VRM Class II objectives; therefore, impacts on the scenic value would be minimal. These activities, though, even if meeting VRM Class II objectives, can all cause erosion, which can affect the scenic value. Limiting travel to existing routes minimizes erosion from cross-country travel but can still cause erosion in the area of use.

Effects under Alternative B

The potential Incandescent Rocks Scenic ACEC would be designated (1,100 acres). The ACEC would be open to fluid mineral leasing, mineral material disposal, and nonenergy mineral leasing. Travel would also be limited to designated routes; impacts would be the same as described under Alternative A.

Fluid mineral leasing would be subject to a CSU stipulation to protect resources other than the ACEC. While a CSU may not generally protect scenic values, the ACEC would be managed according to VRM Class II objectives. Therefore, any fluid mineral development activities would either need to be designed to meet the VRM Class II objectives or they would not be permitted.

The ACEC would be managed as an avoidance area for wind energy development; nearly all of the ACEC would be managed as an avoidance area for other ROWs. Placing ROWs outside of the area if possible or applying ROW avoidance stipulations, would minimize impacts on the scenic value and surface disturbance.

Effects under Alternative C

The potential Incandescent Rocks Scenic ACEC (1,100 acres) would be designated. It would be closed to fluid mineral leasing, mineral material disposal, nonenergy mineral leasing, and ROW development. These closures would preclude impacts on the scenic value and any erosion due to these types of activities. In addition, most of the area would be closed to motorized use, which would limit erosion. However, the area would still be accessible via mechanized means, so vandalism would still be possible.

The ACEC would also be recommended for withdrawal from locatable mineral entry. This withdrawal, if processed, would help prevent surface disturbance and protect scenic values from the visual impacts associated with locatable mineral development.

Because the area would be managed for day use only, the potential for vandalism would likely decrease if most of the vandalism occurs after dark.

Effects under Alternative D

The potential Incandescent Rocks Scenic ACEC (1,100 acres) would be designated (1,100 acres). The ACEC would be open to fluid mineral leasing, mineral material disposal, and nonenergy mineral leasing. Travel would also be limited to designated routes, and impacts would be the same as described under Alternative A.

Fluid mineral leasing would be subject to a CSU stipulation, which could help minimize impacts on the scenic value and of erosion.

The ACEC would be managed as an avoidance area for wind energy development, and nearly all of the ACEC would be managed as an avoidance area for other ROWs. Placing ROWs outside of the area if possible or applying ROW avoidance stipulations would minimize impacts on the scenic value and erosion. It is unlikely that aboveground utilities could be placed in the area and still meet VRM Class II objectives, therefore, there is little threat from this type of activity.

The ACEC would be recommended for withdrawal from locatable mineral entry, and impacts would be the same as described under Alternative C.

Effects under Alternative E

The potential Incandescent Rocks Scenic ACEC (1,100 acres) would be designated. The ACEC would be closed to fluid mineral leasing and nonenergy mineral leasing. Travel would also be limited to designated routes; impacts would be the same as described under Alternative C. Most of the area (1,060 acres) would be closed to mineral material disposal, which would result in the same impacts as described under Alternative C. The remaining 50 acres would be open to mineral material disposal, which could cause erosion in the area.

The ACEC would be managed as an avoidance area for wind energy development, and nearly all of the ACEC would be managed as an avoidance area for other ROWs. Impacts would be the same as described under Alternative D.

The ACEC would be recommended for withdrawal from locatable mineral entry, and impacts would be the same as described under Alternative C.

Lassen Red Rock Scenic

Lassen Red Rock Scenic is a potential 800-acre ACEC with identified relevant and important scenic values. The area contains unique and colorful geological features, including bright red, white, and gray pillars, pinnacles, crags and canyons. Major threats are OHV use, mineral exploration, vandalism (e.g., graffiti and rock collection), and erosion due to the development of social trails.

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

The potential Lassen Red Rock Scenic would not be designated as an ACEC under Alternative A. The potential ACEC would be managed as VRM Class III which would allow modifications to the landscape. Allowing this level of landscape modification would impact the scenic value.

The potential ACEC would be open to fluid mineral leasing, mineral material disposal, nonenergy mineral leasing, locatable mineral entry, and ROW development. While these activities, if permitted, must meet VRM Class III objectives, they could still affect the scenic quality of the area.

Travel in the potential ACEC is also limited to existing routes. While this should keep travel on such routes and minimize erosion, affecting the geology that gives the area its scenic value.

Effects under Alternative B

The potential Lassen Red Rock Scenic ACEC would not be designated, but it would be managed as VRM Class IV. This would allow major modifications to the landscape. Impacts would be similar to Alternative A.

The potential ACEC would be open to mineral material disposal and nonenergy mineral leasing; the impacts would be the same as described for Alternative A. However, because the area would be managed as VRM Class IV, more of these activities could be permitted without having to meet higher VRM Class objectives. This would allow for more potential impacts on the scenic quality of the area. These activities can also cause erosion, which affects the geology that gives the area its scenic value.

The potential ACEC would be open to fluid mineral leasing, with a CSU stipulation on 300 acres. This could help minimize some impacts.

A nearly 400-acre portion of the potential ACEC would be an avoidance area for ROWs. Placing ROWs outside of the potential ACEC would mitigate impacts on the scenic value; however, if permitted inside the potential ACEC, it would have the same impacts as described under Alternative A.

Finally, travel would be limited to designated routes, and impacts would be the same as described under Alternative A.

Effects under Alternative C

The potential Lassen Red Rock Scenic ACEC (800 acres) would be designated. The ACEC would be managed as VRM Class II, which would allow low levels of landscape modifications to retain the existing character. This would help maintain the scenic values.

The ACEC would be closed to fluid mineral leasing, mineral material disposal, and nonenergy mineral leasing. This would preclude potential impacts from these types of activities. The ACEC would also be an exclusion area for ROWs, including solar, and for wind. Potential development would be the least of any alternative.

The ACEC would be closed to motorized travel, which would eliminate erosion from motorized travel. However, social trails could be created by nonmotorized travel, which could still cause erosion in sensitive areas.

Effects under Alternative D

The potential Lassen Red Rock Scenic ACEC would not be designated, but it would be managed as VRM Class IV. Impacts would be the same as described under Alternative B. Other allocations, with one exception, would also be the same as under Alternative B, so impacts would be the same.

Alternative D differs from Alternative B in that the potential ACEC would be recommended for withdrawal from locatable mineral entry. If withdrawn, the scenic values would be protected from this type of activity.

Effects under Alternative E

The potential Lassen Red Rock Scenic ACEC would not be designated. The BLM would manage 600 acres of Lassen Red Rock Scenic as VRM Class IV; impacts would be the same as described under Alternative B in this area, except that Alternative E would manage 400 acres as closed to mineral material disposal. The remaining 200 acres would be managed as VRM Class II, and impacts would be the same as described under Alternative C.

Other allocations would be the same as under Alternative B, so impacts would be the same.

Namazii Wunu Cultural

Namazii Wunu Cultural is a potential 158,300-acre ACEC with identified relevant and important cultural resource values. It is a traditional use area for the Yerington Paiute Tribe. Major threats are wildfire, OHV use, livestock grazing, and mining.

OHV use can damage archaeological artifacts on the surface and can disrupt the traditional use area used by the Yerington Paiute Tribe. OHVs can also spread seeds of invasive species or damage or remove native vegetation, allowing invasive species to spread. This fuel buildup can increase the frequency and severity of wildfires, which can damage or destroy cultural artifacts and the area for traditional uses by the tribe. Improper livestock grazing can have a similar impact.

Energy and minerals development could impact ACEC values by flattening, destroying, or removing vegetation; changing the visual landscape; spreading weeds; and damaging cultural resources during road and facility construction. An NSO stipulation would eliminate these impacts by prohibiting surface occupancy or surface-disturbing activities from fluid mineral development. A CSU stipulation would allow mineral leasing with certain operational or locational constraints imposed by the BLM to protect an identified resource or value. This stipulation would reduce impacts on cultural values associated with fluid mineral leasing. Closures to leasing of fluid minerals nonenergy solid minerals and to mineral materials disposal would help protect cultural resource values. It would accomplish this by eliminating surface disturbance from energy and minerals development.

Petitioning to withdraw areas from locatable mineral entry could help protect cultural resource values if they were formally withdrawn. Withdrawal would limit the impacts of locatable minerals development on the portions of the ACEC that were withdrawn. Specific impacts of locatable minerals development on cultural resources are of the same nature and type as impacts of general energy and minerals development.

Effects Common to All Alternatives

Approximately 10,200 acres of the potential Namazii Wunu Cultural ACEC overlaps the Burbank Canyons WSA. The WSA is managed as VRM Class I and would be closed to new permanent disturbances that do not meet the nonimpairment standard. Because of this, it is unlikely that the relevant and important values would be impacted in the area of overlap, which accounts for 6 percent of the potential ACEC.

Under all alternatives, except for Alternative C, between 5,700 acres and 8,000 acres are identified for disposal. Disposal would move potentially significant cultural resources outside of federal management. However, in all cases, cultural surveys would be required before disposal. If significant resources were discovered, the land would likely remain under federal ownership.

Effects under Alternative A

The potential Namazii Wunu Cultural ACEC would not be designated.

Outside of the WSA, the potential ACEC would be open for fluid mineral leasing, nonenergy mineral leasing, mineral material disposal, locatable mineral entry, and ROW location, including solar energy. Approximately 7,000 acres is available for utility-scale solar development. Development of these resources could result in the impacts described above.

The entire potential ACEC is available for livestock grazing, which can result in the impacts described above.

Outside of the WSA, 124,100 acres would be open to cross-country travel. This type of travel area designation has the greatest potential for damage to or destruction of cultural resources and for weed spread and potentially wildfire. The remaining area is limited to existing routes, which can minimize damage to specific locations.

Effects under Alternative B

The potential Namazii Wunu Cultural ACEC would be designated (158,300 acres). Approximately 3,600 acres would overlap the Churchill Narrows Buckwheat Botanical ACEC.

Outside the WSA, the potential ACEC would be open to fluid mineral leasing; 18,800 acres would be subject to an NSO stipulation, and the entire area outside the WSA would be subject to a CSU stipulation. These stipulations would protect cultural resources, as described above. However, the CSU stipulation relies on project design, siting, and implementation of appropriate mitigation measures and monitoring protocols to ensure that resources are adequately safeguarded. Application of the CSU stipulation across a portion of the potential ACEC would mitigate impacts from fluid mineral development, but the stipulation would not eliminate all impacts.

The ACEC outside of the WSA would be open for mineral material disposal, nonenergy mineral leasing, and locatable mineral entry. Impacts would be the same as described for Alternative A.

The ACEC outside of the WSA would be managed as a ROW avoidance area, although only 79,100 acres would be avoidance areas for wind energy development. While ROW development could occur in the area under certain conditions, development and placement of facilities should take into account the cultural resources at the project level to minimize impacts. The entire ACEC would be an exclusion area for utility-scale solar, eliminating potential impacts from this type of development.

The entire ACEC would be available for livestock grazing; impacts would be the same as under Alternative A.

Outside the WSA, travel would be limited to designated routes. This would reduce the potential for damage to or destruction of cultural resources to the routes themselves. However, during the designation process, routes that avoid such resources would likely be considered.

Approximately 56,500 acres of the ACEC would overlap the Pine Nut ERMA. While recreation may be highlighted in the ERMA, it is more likely that it would be monitored there, as opposed to areas not designated as recreation management areas; thus, impacts could be identified and mitigated earlier.

Effects under Alternative C

The potential Namazii Wunu Cultural ACEC would be designated (158,300 acres). Approximately 3,600 acres would overlap the Churchill Narrows Buckwheat Botanical ACEC, 45,800 acres would overlap the Pine Nut Bi-State Sage Grouse ACEC, and 130 acres would overlap the Pine Nut Mountains Williams Combleaf Botanical ACEC.

All of the ACEC would be closed to fluid mineral leasing, mineral material disposal, nonenergy mineral leasing, and livestock grazing. The ACEC would also be managed as a ROW exclusion area, including for utility-scale solar and wind energy development, and would be closed to SRPs. Precluding these types of activities would prevent damage to and destruction of the cultural resources and would also preserve the traditional use area for the tribe.

Except for 14,100 acres that would be closed to motorized and mechanized travel, 144,100 acres of the ACEC would be closed to motorized travel. Mechanized travel would be limited to designated routes. This would further reduce potential impacts from OHV use.

Approximately 115,800 acres of the ACEC would overlap the Pine Nut and Singatse ERMA. Dispersed motorized opportunities would be highlighted in the Singatse ERMA; however, because the ACEC would be closed to motorized travel, recreation in the ACEC is unlikely to impact the buckwheat in the area of overlap.

Effects under Alternative D

The potential Namazii Wunu Cultural ACEC would not be designated. In the potential Namazii Wunu Cultural ACEC, which would not be designated, approximately 3,600 acres would overlap the Churchill Narrows Buckwheat Botanical ACEC; 270 acres would overlap the Pine Nut Mountains Williams Combleaf Botanical ACEC.

Outside the WSA, the potential ACEC would be open to fluid mineral leasing, 80,300 acres would be subject to an NSO stipulation, and 88,800 acres would be subject to a CSU stipulation. These stipulations would protect cultural resources, as described above. However, the CSU stipulation relies on project design, siting, and implementation of appropriate mitigation measures and

monitoring protocols to ensure that resources are adequately safeguarded. Application of the CSU stipulation across a portion of the potential ACEC would mitigate impacts from fluid mineral development, but the stipulation would not eliminate all impacts. In both the NSO and CSU, the stipulations would not be targeted to protect the cultural resource value. If the BLM Authorized Officer were to except, modify, or waive the restrictions, impacts could occur.

The ACEC outside of the WSA would be open for mineral material disposal, nonenergy mineral leasing, and locatable mineral entry (except for 270 acres that would be proposed for withdrawal, less than 1 percent of the potential ACEC). Impacts would be the same as described for Alternative A.

Outside the WSA, 57,900 acres would be a ROW avoidance area, 68,200 acres would be an avoidance area for wind, and 3,400 acres would be available for solar energy development. Impacts would be the same as described for Alternative A but over a different area.

The entire potential ACEC would be available for livestock grazing; impacts would be the same as under Alternative A.

Outside the WSA, travel would be limited to designated routes, and impacts would be the same as under Alternative B. Approximately 56,500 acres of the ACEC would overlap the Pine Nut ERMA; impacts would be the same as under Alternative B.

Effects under Alternative E

The potential Namazii Wunu Cultural ACEC would not be designated.

Outside the WSA, 9,600 acres would be closed to fluid mineral leasing, precluding impacts from surface disturbance. The remaining 138,400 acres of the potential ACEC would be open to fluid mineral leasing, 93,800 acres would be subject to an NSO stipulation, and 82,500 acres would be subject to a CSU stipulation. These stipulations would protect cultural resources. However, the CSU stipulation relies on project design, siting, and implementation of appropriate mitigation measures and monitoring protocols to ensure that resources are adequately safeguarded. Application of the CSU stipulation across a portion of the potential ACEC would mitigate impacts from fluid mineral development, but the stipulation would not eliminate all impacts.

Outside the WSA, 73,200 acres would be closed to mineral material disposal, 90,100 acres would be closed to nonenergy mineral leasing, and 3,600 acres would be proposed for withdrawal from locatable mineral entry. In these areas, cultural resources and traditional uses would be protected. The remaining potential ACEC would be open to such uses and could experience impacts.

Outside the WSA, 80,000 acres would be managed as a ROW avoidance area. Within the ACEC, 28,400 acres would be managed as an avoidance area for wind energy development, and 72,300 acres would be managed as exclusion areas for wind energy development. In these areas, cultural resources and traditional uses would be protected. The remaining potential ACEC would be open to such uses and could experience impacts. Approximately 2,400 acres would be identified as variance areas for utility-scale solar development.

The entire potential ACEC would be available for livestock grazing; impacts would be the same as under Alternative A.

Outside of the WSA, travel would be limited to designated routes; impacts would be the same as under Alternative B. Approximately 115,800 acres of the potential ACEC would overlap the Pine Nut and Singatse ERMA. While recreation may be highlighted in the ERMA, it is more likely that it would be monitored, as opposed to areas not designated as recreation management areas; thus, impacts could be identified and mitigated earlier.

Pah Rah High Basin (Dry Lakes) Petroglyph District

Pah Rah High Basin (Dry Lakes) Petroglyph District is a potential 5,300-acre ACEC with identified relevant and important cultural resource values. Evidence indicating that Native Americans used the site for over 3,500 years includes petroglyphs, rock rings, stone artifacts, and seasonal and residential camps. The site is culturally significant to both the Southern Washoe and Northern Paiute Tribes. Major threats are livestock grazing, target shooting, OHV use, trash accumulation, and theft and vandalism of artifacts. Increased urbanization and encroachment, which also threaten the cultural resources, are discussed under cumulative effects.

It has been reported that livestock grazing in the area have rubbed against the petroglyphs. Over time, this may cause them to wear away, removing evidence of the cultural past. Livestock grazing may also damage the riparian areas in the potential ACEC by trampling or consuming vegetation.

The increase in OHV use in the area can damage or destroy artifacts in the potential ACEC. In addition, increased access to the area would result in increased OHV use, which can lead to the accumulation of trash and theft or vandalism of artifacts.

Effects Common to All Alternatives

Under all alternatives, the ACEC would be open to noncommercial target shooting, which can also damage or destroy artifacts if directly hit.

Effects under Alternative A

Currently 3,900 acres of the 5,300 acre potential ACEC are designated as the Pah Rah High Basin (Dry Lakes) Petroglyph District ACEC. The area, including the area not designated as an ACEC, is available for livestock grazing, so the

potential for them to rub against the petroglyphs exists. Travel in the ACEC and potential ACEC is limited to existing routes. This minimizes the risk of damage to or destruction of artifacts to just those routes used for travel.

Effects under Alternative B

All 5,300 acres of the potential ACEC would be designated as the Pah Rah High Basin Petroglyph ACEC. Management in the ACEC would be similar to Alternative A, so impacts are expected to be similar. Under Alternative B the ACEC also overlaps the Pah Rah ERMA, which would be designated to provide for mountain biking, hiking, and environmental education opportunities. Management would be compatible with protecting the archaeological resources.

Effects under Alternative C

All 5,300 acres of the potential ACEC would be designated as the Pah Rah High Basin Petroglyph ACEC. The ACEC would not be available for livestock grazing, eliminating the threat of them rubbing against the petroglyphs. In order to keep livestock out, however, fences or other barriers would need to be constructed. Construction and maintenance could damage or destroy cultural artifacts in the area.

The ACEC would also be closed to motorized travel, eliminating the risk from this type of use. However, mechanized travel would still be permitted on designated routes and could damage resources on the routes. Limiting travel to just mechanized use may reduce the level of access to the area, which would also likely reduce the amount of trash buildup, vandalism, and looting.

Under Alternative C the ACEC also overlaps the Pah Rah ERMA. This would be designated to provide for mountain biking, hiking, and environmental education opportunities, while emphasizing protection of cultural, historical, and natural resources. Management would be compatible with protecting the archaeological resources.

Effects under Alternative D

All 5,300 acres of the potential ACEC would be designated as the Pah Rah High Basin Petroglyph ACEC. Management would be similar to Alternative B, except that the ACEC would not be available for livestock grazing, eliminating the threat of them rubbing against the petroglyphs. In order to keep livestock out, however, fences or other barriers would need to be constructed. Construction and maintenance could damage or destroy cultural artifacts in the area.

Effects under Alternative E

All 5,300 acres of the potential ACEC would be designated as the Pah Rah High Basin Petroglyph ACEC. Management would be similar to Alternative B; however, the ACEC would also be closed to mineral material disposal and would be managed as a ROW exclusion area, instead of avoidance. These additional restrictions would further preclude surface-disturbing activities that could damage or destroy cultural resources.

***Pine Nut Mountains Williams Combleaf Botanical and Virginia Range
Williams Combleaf Botanical***

Pine Nut Mountains Williams Combleaf Botanical (330 acres) and Virginia Range Williams Combleaf Botanical (470 acres) are potential ACECs with identified relevant and important biological values. The areas contain habitat for Williams combleaf (*Polypodium williamsiae*), a BLM sensitive species and a State of Nevada critically endangered species. The playa lakes in the Pine Nut Mountains Williams Combleaf Botanical potential ACEC are also important strutting grounds next to nesting areas for the Bi-State sage grouse. Major threats are invasive species, OHV use, and livestock grazing.

OHVs and domestic livestock can spread the seeds of invasive species that can outcompete and eradicate the Williams combleaf plants. Trampling by livestock and OHVs compacts soil and disrupts the recharge of soil moisture into the habitat. Because the Williams combleaf plant is restricted to a narrow margin around the playa lakes, alteration to the hydrology and to the wet and dry cycles of the playa lakes can reduce plant densities or extirpate the species.

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

The Virginia Range Williams Combleaf Habitat ACEC (470 acres) would be designated, but the potential Pine Nut Mountains Williams Combleaf Botanical ACEC is not.

The Virginia Range Williams Combleaf Habitat ACEC overlaps an area that would be closed to locatable mineral entry, fluid mineral leasing, and nonenergy mineral leasing for other resource concerns. However, the area is available for livestock grazing, which can compact the soils and lead to impacts described above. Travel in the area is limited to existing routes, which can help keep recreationists on established routes away from the fragile plants. This minimizes soil compaction and impacts caused by soil compaction.

The Pine Nut Mountains Williams Combleaf Botanical potential ACEC is available for livestock grazing, would be open to cross-country OHV use, fluid mineral entry, and mineral material disposal. These uses can spread the seeds of noxious weeds that can outcompete and eradicate the Williams combleaf plants. They can also compact the soil, which can lead to the impacts described above, or trample the plant.

Effects under Alternative B

The Virginia Range Williams Combleaf Habitat ACEC would be designated (470 acres), but the Pine Nut Mountains Williams Combleaf Botanical ACEC would not. In the potential Pine Nut Mountains Williams Combleaf Botanical ACEC, 270 acres would overlap the Namazii Wunu Cultural ACEC and 50 acres would overlap the Tagim aša Cultural ACEC.

Management of the Virginia Range Williams Combleaf Habitat ACEC would be the same as described under Alternative A, so impacts would be the same.

The Pine Nut Mountains Williams Combleaf Botanical potential ACEC would be managed similarly to Alternative A; however, 320 of the 330-acre potential ACEC would be open to fluid mineral leasing, subject to a CSU stipulation. The CSU stipulation would allow fluid mineral leasing with certain operational or locational constraints imposed by the BLM. The CSU stipulation relies on project design, siting, and implementation of appropriate mitigation measures and monitoring protocols to ensure that resources are adequately safeguarded.

Application of the CSU stipulation across a portion of the potential ACEC would mitigate impacts from fluid mineral development, but the stipulation would not be targeted to protect the Williams combleaf.

In addition, all of the Pine Nut Mountains Williams Combleaf Botanical potential ACEC would be limited to designated routes. This could minimize the soil compaction and the impacts that result. It can also minimize the spread of invasive species that might outcompete or eradicate the Williams combleaf plant.

Effects under Alternative C

Both the Virginia Range Williams Combleaf Habitat ACEC (470 acres) and the Pine Nut Mountains Williams Combleaf Botanical ACEC (330 acres) would be designated. In the latter, 270 acres would overlap the Namazii Wunu Cultural ACEC, 190 acres would overlap the Pine Nut Bi-state Sage Grouse ACEC, and 50 acres would overlap the Tagim aša Cultural ACEC.

As under Alternative A, the Virginia Range Williams Combleaf Habitat ACEC would be closed to fluid mineral leasing, locatable mineral entry, and nonenergy mineral leasing. Under Alternative C, the ACEC would also be closed to mineral material disposal, providing some additional protection. Most important, the ACEC would be closed to motorized and mechanized travel; this would reduce opportunities for soil compaction and weed spread, compared to Alternative A.

The Virginia Range Williams Combleaf Habitat is completely within the Virginia Range ERMA, which would be managed specifically for recreation, while protecting cultural, historical, and natural resources.

Because of the overlap with the Namazii Wunu Cultural ACEC, the Pine Nut Bi-State Sage Grouse ACEC, and the Tagim aša Cultural ACEC, the Pine Nut Mountains Williams Combleaf Botanical ACEC would be closed or mostly (about 98 percent) closed to fluid mineral leasing and mineral material disposal. About 98 percent of the ACEC would also be managed as a ROW exclusion area. This would eliminate, or nearly eliminate, impacts from surface disturbance. Most important, the ACEC would not be available for to livestock

grazing and motorized and mechanized travel. This would reduce opportunities for soil compaction and weed spread, compared to Alternative A.

Approximately 300 acres of the Pine Nut Mountains Williams Combleaf Botanical ACEC would overlap with the Pine Nut ERMA. While recreation may be highlighted in the ERMA, it is more likely that it would be monitored, as opposed to areas not designated as recreation management areas; thus, impacts could be identified and mitigated earlier.

Effects under Alternative D

Both the Virginia Range Williams Combleaf Habitat ACEC (470 acres) and the Pine Nut Mountains Williams Combleaf Botanical ACEC (330 acres) would be designated. In the Pine Nut Mountains Williams Combleaf Botanical ACEC, 50 acres would overlap the Tagim aša Cultural ACEC.

As under Alternative C, motorized and mechanized travel would be limited to designated routes, and impacts would be the same as those described under Alternative A.

Under Alternative D, the Pine Nut Mountains Williams Combleaf Botanical ACEC would be available for livestock grazing; impacts would be the same as under Alternative A. Motorized and mechanized travel would be limited to designated routes, which would minimize impacts from soil compaction and the spread of invasive species.

Effects under Alternative E

The Virginia Range Williams Combleaf Habitat ACEC (470 acres) would be designated, but the Pine Nut Mountains Williams Combleaf Botanical ACEC would not.

Management of the Virginia Range Williams Combleaf Habitat ACEC would be similar to that under Alternative B, except that the ACEC would be completely within the Virginia Range ERMA. While recreation may be highlighted in the ERMA, it is more likely that it would be monitored. This differs from areas not designated as recreation management areas, and so impacts could be identified and mitigated earlier. In cases where there may be conflicting management objectives, the ACEC management would take precedence over ERMA management.

Pine Nut Mountains Williams Combleaf Botanical potential ACEC would be available for livestock grazing; thus, the potential for impact would be the same as under Alternative A. Motorized and mechanized travel would be limited to designated routes, which could minimize the soil compaction and the impacts that result, as well as greatly reduce or eliminate trampling of the plant. It can also minimize the spread of invasive species that might outcompete or eradicate the Williams combleaf plant.

Approximately 300 acres of the Pine Nut Mountains Williams Combleaf Botanical potential ACEC would overlap with Pine Nut ERMA. Impacts would be the same as described under Alternative C.

Ruhenstroth Paleontological

Ruhenstroth Paleontological is a potential 2,300-acre ACEC with identified relevant and important paleontological values. The area contains an abundance of vertebrate fossils in the Sunrise Pass geologic formation. Major threats are unauthorized collection and unauthorized recreation, including OHV use.

Unauthorized OHV use, such as the creation of social trails, can damage or destroy paleontological resources at the surface. Conversely, ground disturbances monitored by qualified paleontologists could lead to the discovery and recovery of scientifically significant fossils.

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

The Ruhenstroth Paleontological ACEC is not designated. There is currently little management in the Ruhenstroth area that would prevent OHV use and other unauthorized recreation. As such, the potential exists for both fossil damage and additional scientific discoveries.

Effects under Alternative B

The Ruhenstroth Paleontological ACEC would be designated (2,300 acres). Approximately 580 acres would be identified for disposal, which would transfer relevant and important values that have yet to be discovered out of BLM management.

Under Alternative B, travel in the ACEC would be limited to designated routes. This would minimize risks of damage to resources by keeping recreationists on routes designated to avoid sensitive resources.

The ACEC would be entirely within the Pine Nut ERMA. While recreation may be highlighted in the ERMA, it is more likely that it would be monitored, as opposed to areas not designated as recreation management areas; thus, impacts could be identified and mitigated earlier on. In cases where there may be conflicting management objectives, the ACEC management would take precedence over ERMA management.

Effects under Alternative C

The Ruhenstroth Paleontological ACEC would be designated (2,300 acres). It would not be available for livestock grazing, fluid mineral leasing, mineral material disposal, and nonenergy mineral leasing. The ACEC would also be managed as a ROW exclusion area and would be closed to SRPs. These restrictions would preclude impacts on the relevant and important values but

may also reduce opportunities for scientific discovery. Furthermore, the ACEC would be closed to motorized travel, while mechanized travel would be limited to designated routes. The potential for damage from motorized use would be eliminated, although mechanized travel could still impact paleontological resources.

The ACEC would be entirely within the Pine Nut ERMA. Impacts would be the same as described under Alternative B.

Effects under Alternative D

The Ruhenstroth Paleontological ACEC (2,300 acres) would be designated. Management would be the same as under Alternative B, so impacts would be the same.

Effects under Alternative E

The Ruhenstroth Paleontological ACEC would be designated (2,300 acres). The ACEC would be closed to fluid mineral leasing, mineral material disposal, and nonenergy mineral leasing. It would be managed as a ROW exclusion area and would be proposed for withdrawal from locatable mineral entry. These restrictions would preclude impacts on the relevant and important values but may also reduce opportunities for scientific discovery.

Under Alternative E, travel in the ACEC would be limited to designated routes. This would minimize risks of damage to resources by keeping recreationists on routes designated to avoid sensitive resources.

The ACEC would be entirely within the Pine Nut ERMA. Impacts would be the same as described under Alternative B.

Steamboat Buckwheat Botanical

Steamboat Buckwheat Botanical is a potential 80-acre ACEC with identified relevant and important biological values. The area is habitat for steamboat buckwheat (*Eriogonum ovalifolium* var. *williamsiae*), a federally endangered and State of Nevada critically endangered species, and also the altered andesite buckwheat (*E. robustum*), a BLM sensitive species. Major threats are disruption of thermal hydrologic processes, which create and maintain habitat over time, OHV use, invasive species, and urbanization (discussed under Cumulative Effects).

Disturbances that disrupt the soils can lead to a chain of events that would allow for native and nonnative plant species to establish themselves in the area. These species, which compete with the steamboat buckwheat for limited resources, could reduce the density of the Steamboat buckwheat, leading to a possible extinction of this species. Competition from native and nonnative species for resources could reduce the density of the altered andesite buckwheat and potentially lead to extirpation of this species.

Effects Common to All Alternatives

Under all alternatives the potential Steamboat Buckwheat ACEC would be closed to fluid mineral and nonenergy mineral leasing and would be closed to locatable mineral entry. Precluding these developments would prevent soil disruption, stabilizing the habitat allowing for unimpacted seed dispersal and seed germination of the Steamboat buckwheat thus promoting species density and ensuring adequate stage classes needed to ensure a vibrant and robust community.

Under all alternatives, species would receive some protection via BLM compliance with ESA and Section 7 consultation. While actions that “adversely affect” the species may be permitted by the BLM and USFWS, mitigation and conservation measures would be incorporated into any take permit issued by the USFWS in order to reduce the amount of take.

Effects under Alternative A

The Steamboat Buckwheat Botanical ACEC is not designated. Approximately 40 acres of the potential ACEC overlaps the existing Steamboat Hot Springs Geyser Basin ACEC. The potential ACEC would be open to mineral material disposal, which can cause surface-disturbance, making areas vulnerable to invasive plant species introduction and spread.

Motorized and mechanized travel is limited to existing routes, which minimizes the extent of soil disruption in the area but still has the potential for invasive species introduction and spread.

Effects under Alternatives B, D, and E

The Steamboat Buckwheat Botanical ACEC would not be designated. Allocations in the area would be the same as under Alternative A, so potential impacts would be similar.

Effects under Alternative C

The Steamboat Buckwheat Botanical ACEC would be designated (80 acres). The ACEC would be closed to motorized and mechanized travel and is fenced off. This would ensure that activities that would disrupt the soil and habitat do not occur, thereby offering maximum protection.

Steamboat Hot Springs Geyser Basin

Steamboat Hot Springs Geyser Basin is a potential 80-acre ACEC with a previously identified relevant and important geologic value for a unique geyser field and related geothermal features.

Effects Common to All Alternatives

The surface expression of the geyser field no longer exists at the site; therefore managing it as an ACEC is not necessary. This is because the previous relevant and important value is no longer present.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Stewart Valley Fossil Site

The Stewart Valley Fossil Site is a potential 15,900-acre ACEC with identified relevant and important paleontological values for its abundance of fossils. Major threats are unauthorized collection, unauthorized recreation, OHV use, and erosion.

OHV use can damage or destroy paleontological resources at the surface, and erosion can wear away fossil traces. On the other hand, erosion, both natural and from recreational use, can also expose fossils and lead to new scientific discoveries.

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

The Stewart Valley Fossil Site ACEC is designated (15,900 acres). Motorized travel is limited to designated roads, trails, and washes, which helps to keep recreationists in designated areas away from sensitive resources. Commercial and private collection of fossils is prohibited, which keeps that resource available for scientific research and discovery.

Effects under Alternative B

The Stewart Valley Fossil Site ACEC would be designated (15,900 acres). Motorized and mechanized travel would be limited to designated routes, which helps to keep recreationists in designated areas and away from the sensitive resources. Casual collection of fossils would not be explicitly prohibited, which could inadvertently lead to artifacts being taken from the site.

Other surface-disturbing activities, such as ROW location and fluid mineral leasing, would be restricted by managing the area as a ROW exclusion area and applying an NSO to fluid mineral leases. This would prohibit surface disturbance associated with these types of activities, thereby preventing damage.

Finally, 1,400 acres of the ACEC, which is a high-value area, would be withdrawn from locatable mineral entry. If processed, this would prohibit surface disturbance from these types of activities, thereby preventing damage.

Effects under Alternative C

The Stewart Valley Fossil Site ACEC (15,900 acres) would be designated. Motorized and mechanized travel would be limited to designated routes, which helps to keep recreationists in designated areas and away from the sensitive resources in the area. Alternative C would prohibit removing rocks, mineral specimens, semiprecious stones, fossils, and petrified wood, which would keep the resource available for scientific research and discovery.

The ACEC would be closed to fluid mineral leasing, and a 13,600-acre portion would overlap areas closed to mineral material disposal and nonenergy mineral leasing. The same acreage would be managed as a ROW exclusion area. This would prohibit surface disturbance from these types of activities, thereby preventing damage. However, mineral material disposal, nonenergy mineral leasing, and ROW location could still be permitted on 2,400 acres. If permitted, these types of activities could cause damage at the development site. On the other hand, surface disturbance could also lead to new scientific discoveries.

Finally, 1,420 acres of the ACEC, which is a high-value area, would be withdrawn from locatable mineral entry. If processed, this would prohibit surface disturbance from these types of activities, thereby preventing damage.

Effects under Alternative D

The Stewart Valley Fossil Site ACEC would not be designated. Motorized and mechanized travel would be limited to designated routes, which helps to keep recreationists in designated areas and away from the sensitive resources in the area. Casual collection of fossils would not be explicitly prohibited, which could inadvertently lead to artifacts being taken from the site.

Other surface-disturbing activities, such as mineral material disposal, nonenergy mineral leasing, locatable mineral entry, and ROW location, would be permitted. If so, these activities could cause damage at the development site. On the other hand, surface disturbance could also lead to new scientific discoveries.

The potential ACEC would be open to fluid mineral leasing, subject to a CSU stipulation covering 9,400 acres (60 percent). The CSU stipulation would allow fluid mineral leasing, with certain operational or locational constraints imposed by the BLM. The CSU stipulation relies on project design, siting, and implementation of appropriate mitigation measures and monitoring protocols to ensure that resources are adequately safeguarded. Application of the CSU stipulation across a portion of the potential ACEC would mitigate impacts from fluid mineral development, but the stipulation would not be targeted to protect paleontological resources. If the BLM Authorized Officer were to except, modify, or waive the restrictions, impacts could occur.

Effects under Alternative E

The Stewart Valley Fossil Site ACEC (15,900 acres) would be designated. Motorized and mechanized travel would be limited to designated routes, which helps to keep recreationists in designated areas and away from sensitive resources. Alternative E would prohibit removing rocks, mineral specimens, semiprecious stones, fossils, and petrified wood, which would keep these resources available for scientific research and discovery.

As with Alternative C, the ACEC would be closed to fluid mineral leasing; this would prohibit surface disturbance from these types of activities, thereby preventing damage. The entire ACEC would also be managed as a ROW exclusion area, having the same impact.

Other surface-disturbing activities, such as mineral material disposal and nonenergy mineral leasing, would be permitted; these activities could cause damage at the development site. On the other hand, surface disturbance could also lead to new scientific discoveries.

Finally, 1,420 acres of the ACEC, which is a high-value area, would be withdrawn from locatable mineral entry. If processed, this would prohibit surface disturbance from these types of activities, thereby preventing damage.

Tagim aša Cultural

Tagim aša Cultural is a potential 81,800-acre ACEC with identified relevant and important cultural resource values. The Washoe Tribe of Nevada and California identified the site as an important source of spiritual renewal and subsistence. This includes the collection of a variety of plant and animal resources. The tribal members also use the area for the traditional gathering of the pine nuts. Major threats are wildfire, OHV use, livestock grazing, wood cutting, and locatable minerals mining.

OHV use can damage archaeological artifacts on the surface and can disrupt the traditional use area used by the Washoe Tribe of Nevada and California. OHVs can also spread seeds of invasive species or damage or remove native vegetation, allowing for invasive species to spread. This changing fire regime can increase the frequency and severity of wildfires that can damage or destroy cultural artifacts in the area for traditional uses by the tribe. Improper livestock grazing can have a similar impact.

Wood cutting can remove vegetation that the Washoe Tribe of Nevada and California use for traditional purposes, decreasing their availability for such uses.

Locatable mineral development could impact ACEC values by flattening, destroying, or removing vegetation, desired plant communities, and special status plant species; changing the visual landscape; degrading and fragmenting habitat; disturbing wildlife; spreading weeds; and damaging cultural resources during road and facility construction. Petitioning to withdraw areas from

locatable mineral entry could help protect cultural resource values if they are formally withdrawn. Withdrawal would limit the impacts of locatable minerals development on the portions of the ACEC that were withdrawn.

Effects Common to All Alternatives

Approximately 2,500 acres of the potential Tagim aša Cultural ACEC overlaps the Burbank Canyon WSA. The WSA is managed as VRM Class I and would be closed to new permanent disturbances that do not meet the nonimpairment standard. Because of this, it is unlikely that the relevant and important values would be impacted in the area of overlap, which accounts for 3 percent of the potential ACEC.

Approximately 1,400 acres of the potential ACEC are withdrawn from locatable mineral entry, which would eliminate impacts of locatable minerals development on this area, as described above.

Effects under Alternative A

The Tagim aša Cultural ACEC would not be designated. Outside the WSA, a 29,000-acre portion of the potential ACEC overlaps an area where motorized travel is limited to existing routes. This potentially limits travel to areas away from sensitive resources. In the limited area, potential impacts would be limited to the routes themselves, or just off the route. The remaining 50,300 acres would be open to cross-country travel. Resource damage has the highest potential to occur in the open areas where travel is not restricted.

Except for the 1,400 acres withdrawn from locatable mineral entry (discussed under *Effects Common to All Alternatives*), the entire potential ACEC is also open to locatable mineral entry and could experience the types of impacts described above.

The entire potential ACEC is available for livestock grazing, and wood cutting would continue to be allowed, which could result in the types of impacts described above.

Outside the WSA, 8,400 acres of the potential ACEC are managed as VRM Class II, which would allow low levels of landscape modifications in order to retain the scenic value. This would help maintain the scenic value in the area for the tribe by disallowing development that does not meet the VRM Class II objective, such as aboveground mining.

The remaining 70,900 acres of the potential ACEC are managed as VRM Class III and VRM Class IV. These allow moderate to high levels of landscape modification that aim to partially retain the existing character of the landscape (VRM Class III) or allow for major modifications of the landscape (VRM Class IV). Development in areas managed as VRM Class III or IV could alter the landscape to the extent that it impacts the traditional use of the area by the tribe.

Effects under Alternative B

The Tagim aša Cultural ACEC (81,800 acres) would be designated. Outside the WSA, travel would be entirely limited to designated routes. This would limit impacts on the designated routes themselves and would minimize possible damage elsewhere. Routes would also likely be located away from sensitive resources, so as to further minimize damage.

Except for the 1,400 acres withdrawn from locatable mineral entry (discussed under *Effects Common to All Alternatives*), the entire ACEC would be open to locatable mineral entry. However, because the ACEC would be designated under this alternative, a mining plan of operation would be required, and mitigation could be incorporated to minimize impacts on the cultural resources.

The entire ACEC would be available for livestock grazing which could lead to the types of impacts as under Alternative A.

Wood cutting would be allowed and could result in the same impacts as under Alternative A.

Outside the WSA, the ACEC would be managed according to VRM Class III objectives, which aim to partially retain the existing character of the landscape and allow for moderate levels of change. Development could alter the landscape to the extent that it impacts the traditional use of the area by the tribe, but not as much as under Alternative A.

Approximately 78,900 acres would overlap the Pine Nut ERMA. While recreation may be highlighted in the ERMA, it is more likely that it would be monitored in the area, as opposed to areas not designated as recreation management areas; therefore, impacts could be identified and mitigated earlier.

Effects under Alternative C

The Tagim aša Cultural ACEC (81,800 acres) would be designated; 42,800 acres of the Tagim aša Cultural ACEC would overlap the Pine Nut Bi-State Sage Grouse ACEC; 50 acres would overlap the Pine Nut Mountains Williams Combleaf Botanical ACEC.

Outside the WSA, the ACEC would be closed to motorized travel, thereby eliminating the risk from this type of use. However, mechanized travel would still be permitted on designated routes and could damage resources on the routes. Limiting travel to just mechanized use may reduce the level of access in the area, which would also likely reduce the amount of unauthorized recreation.

The entire ACEC would be recommended for withdrawal from locatable mineral entry, which would limit the types of impacts described above.

The entire ACEC would not be available for livestock grazing, which would eliminate trampling vegetation and weed spread from such use.

Wood cutting would not be allowed, so impacts from this type of use on the availability of traditional vegetation for tribal use would be reduced, compared to Alternative A.

Outside the WSA, the ACEC would be managed according to VRM Class II objectives, which aim to retain the existing character of the landscape and allow for low levels of change. Development could alter the landscape but not likely to the extent that it would impact the tribe's traditional use of the area.

Approximately 78,900 acres would overlap the Pine Nut ERMA. Impacts would be the same as described under Alternative B.

Effects under Alternative D

The Tagim aša Cultural ACEC (81,800 acres) would be designated; 50 acres of the Tagim aša Cultural ACEC would overlap the Pine Nut Mountains Williams Combleaf Botanical ACEC.

Outside the WSA, travel in the area would be entirely limited to designated routes. Impacts would be the same as described under Alternative B.

The 1,400 discussed above under *Effects Common to All Alternatives* and an additional 50 acres of the overlapping Pine Nut Williams Combleaf Botanical ACEC would be withdrawn from locatable mineral entry discussed under *Effects Common to All Alternatives*, the entire ACEC would be open to locatable mineral entry. Impacts would be the same as described under Alternative B.

The entire ACEC would be available for livestock grazing, which could lead to the types of impacts as under Alternative A.

Wood cutting would be allowed and could result in the same impacts as under Alternative A.

Outside the WSA, the ACEC would be managed according to VRM Class III objectives, which aim to partially retain the existing character of the landscape and allow for moderate levels of change. Development could alter the landscape to the extent that it impacts the tribe's traditional use of the area, but not as much as under Alternative A.

Approximately 78,900 acres would overlap the Pine Nut ERMA. Impacts would be the same as described under Alternative B.

Effects under Alternative E

The Tagim aša Cultural ACEC would not be designated.

Outside the WSA, travel would be entirely limited to designated routes. Impacts would be the same as described under Alternative B.

Except for the 1,400 acres withdrawn from locatable mineral entry (discussed under *Effects Common to All Alternatives*), the entire ACEC would be open to locatable mineral entry. Impacts would be the same as described under Alternative A.

The entire potential ACEC would be available for livestock grazing, which could lead to the types of impacts as under Alternative A.

Wood cutting would be allowed and could result in the same impacts as under Alternative A.

Outside of the WSA, the potential ACECs are managed as VRM Class III or Class IV. This allows moderate to high levels of landscape modification that aim to partially retain the existing character of the landscape (VRM Class III) or allow for major modifications of the landscape (VRM Class IV). Development in areas managed as VRM Class III or IV could alter the landscape to the extent that it impacts the tribe's traditional use of the area.

Approximately 78,900 acres would overlap the Pine Nut ERMA. Impacts would be the same as described under Alternative B.

Virginia City National Landmark Historic District

The Virginia City National Landmark Historic District is a potential 14,700-acre ACEC with identified relevant and important cultural resource values. It was designated by the National Park Service as a National Historic Landmark in 1961, and it is also listed on the NRHP. It is recognized as nationally significant for its role in the Civil War, the creation of the State of Nevada, as well as for the many significant developments in mining and milling technology and water systems that occurred there.

More than a century of mining and milling has led to a landscape riddled with abandoned mines, deep shafts, and ground instability. Early milling processes left the soils and watershed of Virginia City contaminated with mercury, arsenic, and other EPA-listed contaminants. Major threats are looting, vandalism, structural fire, gold mining, ROWs, and wind energy development. Increased urbanization, which also threatens the area, is discussed under cumulative effects.

Locatable mineral development could impact ACEC values by flattening, destroying, or removing vegetation, desired plant communities, and special status plant species; changing the visual landscape; and damaging cultural resources during road and facility construction. Petitioning to withdraw areas from locatable mineral entry could help protect cultural resource values if they were formally withdrawn. This would eliminate the impacts of locatable minerals development on the portions of the ACEC that were withdrawn.

Identifying ACECs as ROW or wind exclusion or avoidance areas would protect historical values by reducing (for avoidance areas) or eliminating (for exclusion

areas) impacts from development requiring a ROW permit, including utilities, access roads, and renewable energy. This would help to preserve the historical setting of the area.

Effects Common to All Alternatives

Under all alternatives, the BLM would need administrative- or implementation-level actions to reduce the impacts of looting, vandalism, and structural fire. Because access would not be significantly restricted under any of the alternatives, these types of activities could still occur.

Approximately 1,000 acres of the potential ACEC are withdrawn from locatable mineral entry, which would limit the impacts of locatable minerals development, as described above, on this area. Except for the existing withdrawal, the entire potential ACEC would be open to locatable mineral entry and could experience the types of impacts described above.

Effects under Alternative A

The potential Virginia City National Landmark Historic District ACEC would not be designated. In addition to the impacts described under *Effects Common to All Alternatives*, the potential ACEC would be open to ROW location, including for wind energy. Development could damage historical artifacts and could also diminish the historical setting of the area. However, because the district is listed on the NRHP, it is unlikely that aboveground utilities that affect the NRHP listing would be permitted.

Effects under Alternative B

The Virginia City National Landmark Historic District ACEC would be designated (14,700 acres). In addition to the impacts described under *Effects Common to All Alternatives*, only 530 acres of the ACEC would overlap an area that would be managed as a ROW avoidance area and 1,100 acres would overlap the identified avoidance area for wind. Development could damage historical artifacts and could also diminish the historical setting of the area. However, because the district is listed on the NRHP, it is unlikely that aboveground utilities that affect the NRHP listing would be permitted.

Effects under Alternative C

The Virginia City National Landmark Historic District ACEC would be designated (14,700 acres). In addition to the impacts described under *Effects Common to All Alternatives*, the ACEC would be an avoidance area for ROWs (except for 100 acres managed as ROW exclusion) and an exclusion area for wind ROWs. The exclusion area for wind would prevent damage associated with such development. While other ROW development could occur in the area under certain conditions, development and placement of facilities would take into account the historical resources at the project level in order to minimize impacts.

The ACEC would overlap the Virginia Range ERMA, which would be managed specifically for providing recreation, while protecting cultural, historical, and natural resources. No conflicts between the ACEC and the ERMA are expected.

Effects under Alternative D

The Virginia City National Landmark Historic District ACEC would be designated (14,700 acres). In addition to the impacts described under *Effects Common to All Alternatives*, only 560 acres of the ACEC would overlap an area that would be managed as a ROW avoidance area; 1,200 acres would overlap the identified avoidance area for wind. Development could damage historical artifacts and diminish the historical setting of the area. However, because the district is listed on the NRHP, it is unlikely that aboveground utilities that affect the NRHP listing would be permitted.

Effects under Alternative E

The potential Virginia City National Landmark Historic District ACEC would not be designated; however, the entire 14,700-acre potential ACEC would be within the Virginia City National Historic Landmark District. The district would be managed as a ROW avoidance area and a ROW exclusion area for wind energy development. Impacts would be the same as described under Alternative C.

The potential ACEC would overlap the Virginia Range ERMA. While recreation may be highlighted in the ERMA, it is more likely it would be monitored, as opposed to areas not designated as recreation management areas; thus, impacts could be identified and mitigated earlier.

Cumulative Effects

Past and Present Actions

Past and present actions in the cumulative impacts analysis area impacting ACECs include mineral exploration and development, renewable energy, livestock grazing, lands and realty development activities, recreation, travel management, wild horse and burro management, and management of fire, invasive weeds, climate change, and habitat for special status species.

Impacts include surface disturbance and vegetation disturbance, displacement of species, habitat fragmentation, and changes to the visual landscape that could affect resources within ACECs. Impacts would be greater where recreation areas, such as SRMAs or ERMA, or development were next to an ACEC. The BLM would adaptively manage to protect ACEC values and minimize impacts where applicable and feasible.

Reasonably Foreseeable Actions

Reasonably foreseeable future actions are likely to have similar impacts on the past and present actions. Grazing within the Cumulative Impact Analysis Area (CIAA) is expected to continue. On-going mineral exploration and development

and renewable energy development as described in **Table 4-1**, Past, Present, and Reasonably Foreseeable Projects, Plans, or Actions that Make up the Cumulative Impact Scenario, have the potential to impact ACECs by creating surface disturbance and potentially removing sensitive resources. Similarly, ROW grants could result in disturbance of lands. With a projected increase in population and recreational use, there may also be an increase the risk of recreational use and visitation as well as wildfire. However, proposed fuels management projects would reduce fire size or spread and reduce the number of acres burned, reducing the impacts on ACECs and sensitive resources.

Incremental Cumulative Impact – Combined Past, Present, Reasonably Foreseeable Actions – All Alternatives

Under all alternatives, incremental impacts on ACECs would be limited from minerals, lands and realty and renewable energy development as most ACECs have use restrictions applicable to these uses. Incremental impacts from livestock grazing would be higher under Alternatives A and B and would decrease under alternatives C, D, and E due to potential reductions in forage allocation and AUMs. Incremental impacts would increase under all alternatives for recreation, as public use would continue to increase overtime. Alternatives, B, C, D, and E would reduce OHV impacts within ACECs due to designation of travel management areas. Vegetation and habitat improvement projects and managing wild horses and burros to AML would improve ACEC vegetation values under all alternatives. Impacts relating to climate change would continue with impacts dependent on drought conditions.

4.5.2 Back Country Byways

Summary

Impacts on Back Country Byways (Back Country Byway) are those that affect access to view the unique visual, cultural, historic, or geologic features.

Alternative D would result in the greatest impact on Back Country Byway interpretive opportunities because it would not designate any Back Country Byway. Alternative A would continue the Fort Churchill to Wellington Back Country Byway but would not designate or manage any new Back Country Byway. Alternative C would add new routes to the Back Country Byway network. It would provide the most protection from changes to unique visual, historic, cultural, and geologic features. However, Alternative C would also rescind the existing Fort Churchill to Wellington Back Country Byway; this would eliminate Back Country Byway-related interpretive opportunities along that route. Alternatives B and E would provide similar benefits to Back Country Byway. Both alternatives would expand the Back Country Byway network and limit uses that conflict with a Back Country Byway unique features and the public's opportunity to interpret them. Because Alternative E would have more restrictions on conflicting uses than Alternative B, it would maintain or enhance interpretive opportunities more than any other alternative.

Table 4-22, Miles of Back Country Byways, summarizes the distribution of Back Country Byway miles for each alternative.

Table 4-22
Miles* of Back Country Byways by Alternative

Back Country Byway	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Fort Churchill to Wellington	33	30	0	0	30
Marietta	0	33	41	0	33
New Pass to Hawthorne	0	111	71	0	111
Total	33	174	112	0	174

*Miles shown are those on BLM-administered lands only.

Source: BLM 2014

Methods of Analysis

Methods and Assumptions

The following methods and assumptions were used to assess the impacts on Back Country Byways:

- The nature and types of potential impacts on Back Country Byway from proposed actions under each alternative are based on
 - numerical data gathered during the planning process
 - BLM interdisciplinary team knowledge of the resource
 - input provided during the public scoping process

Where possible, this analysis uses quantitative data to describe impacts on Back Country Byway from other resources and resource use programs. Qualitative information is also used to support quantitatively based analysis or where numerical data does not exist. In all cases, best professional judgment is used in evaluating effects on the lands and realty program.

- Driving for pleasure will continue to be a popular use of BLM-administered lands.
- The scenic quality of Back Country Byway and associated Back Country Byway user experience and opportunity to interpret unique features along the route is directly influenced by the visual character of the surrounding landscape.
- Signs, public kiosks, online maps, social media, and other sources of public information improve public interpretation and exploration opportunities of Back Country Byway.
- The use of public lands for family oriented adventure travel and historical tourism will continue to increase.

Indicators

The following indicators were used to assess the degree of impacts on Back Country Byway:

- Availability of opportunities for the public to interpret, understand, and view features being highlighted by the Back Country Byway
- Change to the unique scenic, historic, cultural, or geologic landscape characteristics that the Back Country Byway is intended to highlight

Nature and Type of Effects

Management actions that preserve the unique scenic, historic, cultural, and geologic characteristics of the surrounding landscape maintain or enhance public interpretation and exploration opportunities. Actions that improve public access and understanding of Back Country Byway also support the purpose of Back Country Byway as an opportunity to explore unique public landscapes and historical settings. Resource or resource use programs that alter the character of the Back Country Byway and surrounding landscape would decrease its intended interpretive values.

Intensification of uses can decrease overall Back Country Byway quality by changing the Back Country Byway visual, historic, cultural, or geologic character. Examples of these uses are minerals or energy development, livestock grazing, ROW authorizations, and increases in public visitation and OHV use along or near Back Country Byway. Management actions emphasizing resource preservation (e.g., closure to motorized travel) could also reduce the intended value of Back Country Byway. This would occur if such actions would limit interpretive opportunities.

The extent of the impacts from management of resources and resource uses varies by alternative because of the various Back Country Byway segments and lengths in each alternative and the variation in management of resources and resource uses in each alternative.

Management for the following resources would not result in an effect on Back Country Byway: air quality, water, soil, caves and cave resources, paleontological resources, forestry and woodland products, WSAs, WSRs, tribal interests, and public health and safety.

Back Country Byway: Effects from Climate Management*Effects Common to All Alternatives*

There are no effects common to all alternatives.

Effects under Alternative A

Under Alternative A, the unique character of landscapes in the planning area would continue to change. In response to climatic factors such as drought and

extreme precipitation. Indirect effects on the Fort Churchill to Wellington Back Country Byway from climate change would be from increased wildfire potential, and flooding. These and other events could alter the overall character of the landscape and the public's ability to view and interpret key features along the route.

The BLM would continue to manage climate change with an emphasis on drought management on a case by case basis. Climate-related landscape changes surrounding the Fort Churchill to Wellington Back Country Byway would continue and development of strategies to mitigate impacts would occur as needed.

Effects under Alternative B

Compared to Alternative A, climate management under Alternative B would lead to more protections on ecosystem functions. Alternative B proposes the identifying and mitigating threats from climate change. This would protect the opportunities to view and interpret unique features along the Fort Churchill to Wellington Back Country Byway. Climate management would also preserve all interpretive opportunities along the Marietta and New Pass to Hawthorne Back Country Byway, proposed to be designated under Alternative B.

Effects under Alternative C

The nature and types of impacts on the Marietta and New Pass to Hawthorne Back Country Byway from climate management would be similar to those under Alternative B; however, the impacts would apply to slightly different route configurations (see **Table 4-22**, Miles of Back Country Byways by Alternative).

Effects under Alternative D

The BLM would not designate any Back Country Byway under Alternative D.

Effects under Alternative E

For the Fort Churchill to Wellington Back Country Byway, climate management under Alternative E would provide the most protection from climate-related changes. This alternative would prioritize treatments to remove existing threats that may exacerbate the negative effects of climate change and would develop proactive steps that can be taken to mitigate the effects of climate change. Viewing and interpretation opportunities would be maintained to the extent possible.

For the Marietta and New Pass to Hawthorne Back Country Byway, the *Nature and Types of Effects* from climate management under Alternative E would be similar to those under Alternative C; however, they would apply to 32 more miles of Back Country Byway.

Back Country Byway: Effects from Vegetation Resources

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Management actions for vegetation resources under Alternative A would maintain the visual character of the landscape surrounding the Fort Churchill to Wellington BLM Back Country Byway. This would maintain or improve the condition of rangelands and riparian habitats, would reduce soil erosion, and would maintain a diverse vegetation habitat for livestock, wild horses and burros, and wildlife.

Effects under Alternative B

Management under Alternative B would maintain healthy landscape conditions surrounding Back Country Byway. It also would restore the most sagebrush habitat through pinyon-juniper removal of any alternative. Further management that would allow for the removal of fire-killed and invasive trees, prevent invasive plant species, and protect riparian areas would subsequently preserve the scenic character of landscapes. Compared to Alternative A, management under Alternative B would improve the nature and extent of Back Country Byway-related interpretive opportunities.

Effects under Alternative C

The effects of vegetation resources management on the Marietta and New Pass to Hawthorne Back Country Byway would be similar to those under Alternative B. The difference is that there would be 65 percent fewer overall Back Country Byway miles identified for pinyon-juniper removal and applicability (see **Table 4-22**, Miles of Back Country Byways by Alternative).

Effects under Alternative D

The BLM would not designate any Back Country Byway under Alternative D.

Effects under Alternative E

The effects of vegetation resources management under Alternative E would be similar to those under Alternative B. Compared to Alternative A vegetation resources management under Alternative E would preserve opportunities to interpret unique visual features next to Back Country Byway. It would do this by removing fire-killed and invasive trees, by preventing invasive plant species, and by protecting riparian areas.

Back Country Byway: Effects from Fish and Wildlife Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

The BLM would manage fish and wildlife based on existing land use plans, implementation plans, and by BLM policy and guidance. Site-specific habitat improvement projects may intrude or detract viewing of settings but would improve Back Country Byway viewing over the long term as habitat conditions improve.

Effects under Alternative B

Alternative B includes management to protect fish and wildlife within priority habitat areas and would include applicable CSU stipulations to protect lentic and lotic wildlife habitat. Implementing ROW avoidance restrictions within priority habitat areas and CSU stipulations would maintain Back Country Byway viewing opportunities.

Effects under Alternative C

Alternative C includes the most extensive management to protect fish and wildlife habitats. As a result, wildlife viewing opportunities along the Marietta and New Pass to Hawthorne Back Country Byway would be greatest. However, compared to Alternative A, rescission of the Fort Churchill to Wellington Back Country Byway would eliminate Back Country Byway-related wildlife viewing opportunities on that route.

Effects under Alternative D

The BLM would not designate any Back Country Byway under Alternative D.

Effects under Alternative E

Enhanced Back Country Byway viewing and interpretive opportunities from the management of most fish and wildlife species would be similar to Alternative B and greater than Alternative A. Restrictions on land uses in raptor habitat would result in the same benefits as Alternative C; however, these restrictions would also apply to the Fort Churchill to Wellington Back Country Byway providing additional benefits to Back Country Byway. They would have slightly different configurations for the Marietta and New Pass to Hawthorne Back Country Byway (see **Table 4-22**, Miles of Back Country Byways by Alternative).

Back Country Byway: Effects from Wild Horse and Burro Management*Effects Common to All Alternatives*

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would continue to manage 1,235,200 acres (26 percent) of the planning area within HMAs. It would continue to provide wild horse and burro viewing and interpretive opportunities along 17 miles (52 percent) of the Fort Churchill to Wellington Back Country Byway.

Effects under Alternative B

Alternative B would manage 238,700 acres (19 percent) fewer HMAs than Alternative A. However, there would continue to be 17 miles of the Fort Churchill Back Country Byway in wild horse and burro HMAs. Additionally, the Marietta and New Pass to Hawthorne Back Country Byway would add 44 miles of Back Country Byway in wild horse and burro HMAs. Accordingly, wild horse and burro management under Alternative B would maintain and support Back Country Byway values.

Effects under Alternative C

Alternative C would manage 145,200 acres (12 percent) fewer HMAs than Alternative A. It would add an additional mile of Back Country Byway in wild horse and burro HMAs. Accordingly, compared to Alternative A, wild horse and burro management would maintain and enhance Back Country Byway-related wild horse and burro interpretive opportunities. This would be the case particularly along the Marietta and New Pass to Hawthorne Back Country Byway.

Effects under Alternative D

The BLM would not designate any Back Country Byway under Alternative D.

Effects under Alternative E

Wild horse and burro management under Alternative E would have the same effects as Alternative B by providing 61 miles of wild horse and burro viewing opportunities along Back Country Byway. Compared to Alternative A, management under Alternative E would provide 44 more miles of Back Country Byway-related wild horse and burro viewing and interpretive opportunities.

Back Country Byway: Effects from Wildland Fire Ecology and Management*Effects Common to All Alternatives*

Wildland fire management would restrict access along Back Country Byway during fire-suppression activities in order to provide fire fighter and public safety. Access restrictions would be expected to be short term until the fire is controlled or until access along the Back Country Byway is determined safe.

Effects under Alternative A

BLM wildland fire ecology management under Alternative A would continue to manage wildfires according to a four-tier system. Fewer fire and fuels management objectives and actions would increase the likelihood for fire-related effects on the Fort Churchill to Wellington Back Country Byway.

Effects under Alternative B

Fire and fuels management techniques would reduce the potential for long-term changes to Back Country Byway values compared to Alternative A. In the short term, prescribed fire, vegetation treatments, and other fuels reduction

techniques would temporarily alter the visual qualities of the landscapes surrounding Back Country Byway. Rehabilitation and restoration of burned areas would include prevention of cheatgrass and other invasive species. This would restore the scenic and historic conditions around Back Country Byway after fires, thereby minimizing long-term effects on Back Country Byway-related interpretive opportunities.

Effects under Alternative C

An emphasis on minimal impact fire suppression techniques would reduce fire suppression impacts however since MIST tactics could limit fire suppression efficiency fires could spread quicker or take longer to control. Impacts on viewers could include larger areas burned compared to Alternative A. Rehabilitation and restoration of burned areas would restore scenic and historic conditions available for interpretation around Back Country Byway after fires, thereby minimizing long-term effects.

Effects under Alternative D

The BLM would not designate any Back Country Byway under Alternative D.

Effects under Alternative E

Wildland fire ecology and management under Alternative E provides the full range of management activities and prioritizes the most areas for suppression. Visual settings within Back Country Byway would be less vulnerable to potential wildfire spread. It would have long- and short-term effects similar to those described under Alternative B but with more suppression priority areas.

Back Country Byway: Effects from Cultural Resources Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Protection of NRHP-listed Properties and Districts, National Historic Landmarks, and Traditional Cultural Properties (TCPs) listed, eligible, or known but not yet formally designated for the NHPA Section 106 process would protect cultural resources and help maintain visitor experiences along the Fort Churchill to Wellington Back Country Byway.

Effects under Alternative B

Protective management practices would preserve Back Country Byway-related interpretive opportunities of cultural features more than Alternative A. Protecting NRHP-listed Properties and Districts, National Historic Landmarks, and Traditional Cultural Properties (TCPs) listed, eligible, or known but not yet formally designated would also protect proposed Back Country Byway. Designation of proposed ACECs to protect cultural resources would also protect Back Country Byway if ACECs are within visual settings of Back Country Byway.

Effects under Alternative C

Alternative C would manage for the largest buffer areas around cultural resources and would apply ROW exclusion criteria. It would be the most restrictive alternative and would result in the greatest preservation of Back Country Byway-viewing opportunities and related interpretive opportunities of cultural features.

Effects under Alternative D

The BLM would not designate any Back Country Byway under Alternative D.

Effects under Alternative E

Cultural resources management would preserve unique cultural resource interpretive opportunities of Back Country Byway. Alternative E would do this through expanded restrictions on ROWs, mineral development, and other surface-disturbing activities. Additional restrictions on resource uses along the three miles where Back Country Byway would overlap NHT buffer areas would further preserve Back Country Byway-related interpretive opportunities for cultural features.

Back Country Byway: Effects from Visual Resources Management*Effects Common to All Alternatives*

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would manage 8 miles (24 percent) of the Fort Churchill to Wellington Back Country Byway as VRM Class III and 15 miles (45 percent) as VRM Class IV; the remainder of the Back Country Byway (10 miles or 30 percent) would be undesignated for VRM. Alternative A would allow changes to the visual character of the Back Country Byway landscape in accordance with VRM Class III and IV objectives.

Effects under Alternative B

Impacts would be similar to alternative A. Under Alternative B, 28 miles (94 percent) of the Fort Churchill Back Country Byway would be managed as VRM Class III, with the remaining 2 miles (6 percent) would be managed as VRM Class IV. Compared to Alternative A, fewer acres would be managed as VRM Class IV.

BLM management for the Marietta Back Country Byway would be consistent with VRM Class III objectives. However, the New Pass to Hawthorne Back Country Byway would pass through 3 miles of VRM Class I, 1 mile of VRM Class II, 32 miles of VRM Class III, and 74 miles of VRM Class IV. Visual resource management objectives for Class I and Class II areas would be more restrictive and would result in fewer visual impacts in Back Country Byway viewing areas.

Effects under Alternative C

Alternative C would primarily manage the Marietta and New Pass to Hawthorne Back Country Byway according to VRM Class IV objectives. This would result in less protection from changes to the Back Country Byway landscape under VRM than Alternative B.

Effects under Alternative D

The BLM would not designate any Back Country Byway under Alternative D.

Effects under Alternative E

The entire length of the Fort Churchill Back Country Byway would be within VRM Class IV. Compared to Alternative A, VRM under Alternative E would provide fewer protections from changes to the Back Country Byway landscape. For the Marietta and New Pass to Hawthorne Back Country Byway, visual resources management and corresponding effects on the long-term visual characteristics of Back Country Byway would be the same as Alternative B.

Back Country Byway: Effects from Livestock Grazing Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under Alternative A, the Fort Churchill to Wellington Back Country Byway would continue to overlap areas that are available for livestock grazing and managed according to existing use levels. As a notable feature of Nevada's history and culture, Alternative A would preserve livestock grazing-related interpretive opportunities along the Back Country Byway.

Effects under Alternative B

Areas along the proposed Back Country Byway currently managed as available for livestock grazing would continue to be managed to existing use levels. Management under Alternative B would decrease the likelihood of long-term impacts from grazing on Back Country Byway-related viewing and interpretive opportunities. Examples are prescriptive grazing for vegetation management and prohibitions on continuous year-round grazing.

Effects under Alternative C

The BLM would manage more acres as Back Country Byways than Alternative A and would manage some of those acres as closed to livestock grazing, which could result in less potential for long-term aesthetic changes from grazing and reduced opportunity for conflict with wild horses and burros along the Marietta Back Country Byway. However, closing allotments and reducing AUMs would diminish grazing along the Back Country Byway, limiting interpretive opportunities. Limitations on grazing would restrict the BLM's ability to meet Back Country Byway objectives under Alternative C. This is particularly the case

along the New Pass to Hawthorne Back Country Byway, where a Back Country Byway management objective would be to highlight cattle ranching.

Effects under Alternative D

The BLM would not designate any Back Country Byway under Alternative D.

Effects under Alternative E

Effects from livestock grazing management on Back Country Byway under Alternative E would be the same as described under Alternative B.

Back Country Byway: Effects from Geology and Mineral Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

The BLM would continue to manage all 33 miles along the Fort Churchill to Wellington Back Country Byway as open to all forms of mineral development which would affect Back Country Byway viewing experiences depending on the size of surface disturbance. While Back Country Byway management objectives would highlight Nevada's unique heritage (including the Como Mining District), new mineral development could conflict with the visual and historic qualities of the Back Country Byway landscape.

Effects under Alternative B

With the exception of 3 miles along the New Pass to Hawthorne Back Country Byway, the remaining 171 miles of Back Country Byway would overlap areas open to all forms of mineral development. Impacts on Back Country Byway viewing would be similar to Alternative A. Alternative B would support objectives to highlight Nevada's unique mining heritage. The affected areas would be the Como, Marietta, and Candelaria Mining Districts. Even so, new mineral development could conflict with the visual and historic qualities of the Back Country Byway landscapes. Mineral development would also affect other characteristics. For example vegetation, wild horses and burros, and grazing would be highlighted as part of the Back Country Byway designations. Compared to Alternative A, the nature of effects would be similar under Alternative B but would extend to 138 more miles of Back Country Byway. Undesirable long-term visual impacts from mineral development would be limited due to proposed locatable mineral withdrawals (439,600 acres) and use restrictions more than under Alternative A. These use restriction would include CSU and NSO stipulations applicable to fluid minerals.

Effects under Alternative C

Management under Alternative C would close more acres to mineral development and manage larger areas under NSO stipulations than Alternative A or B. Limitations on mineral development could conflict with Back Country Byway management objectives. This is because BLM management for the

Marietta and New Pass to Hawthorne Back Country Byway would promote mining as an element of Nevada's heritage. However, new mineral development could be incompatible with the historic and aesthetic qualities of such older mining districts as Marietta and Candelaria. Based on proposed mineral development closed areas and CSU and NSO restrictions and stipulations this alternative would provide the most protection of historic settings for Back Country Byway viewing and the potential for viewing intrusions would be lower.

Effects under Alternative D

The BLM would not designate any Back Country Byways under Alternative D.

Effects under Alternative E

Effects from geology and mineral management on Back Country Byways would be similar to Alternative B; however, Alternative E would preserve more interpretive opportunities unrelated to mining. It would accomplish this by closing more areas to fluid and mineral materials development and would apply NSO stipulations to a wider area than Alternative B.

Back Country Byway: Effects from Recreation and Visitor Services

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

The BLM would promote a wide variety of recreation opportunities, including recreational driving, which would support BLM Back Country Byway management objectives. Certain recreation activities, such as shooting, camping, and OHV use, could either conflict or enhance Back Country Byway users experience depending on their personal perspective. Cross-country OHV use would add new linear features to the landscape. This would alter the unique character of the landscape for which the Fort Churchill to Wellington Back Country Byway was designated.

Effects under Alternative B

Similar to Alternative A, recreation and visitor services management under Alternative B would promote a wide variety of recreation opportunities. These include recreational driving, which would support BLM Back Country Byway management objectives. Seventy (70) miles (40 percent) of Back Country Byways would cross ERMA's where the BLM would focus additional management on providing users with quality recreation opportunities. Because of this, effects would vary, depending on the recreation management objectives within each ERMA. However, the effects would in general maintain or have neutral effects on Back Country Byway-related interpretive opportunities in those areas.

Effects under Alternative C

Alternative C would support the use of Back Country Byways for recreation, such as driving for pleasure, hiking, or biking. Forty-five (45) miles (39 percent)

of Back Country Byway would cross ERMA, while less than one mile of the New Pass to Hawthorne Back Country Byway would cross a SRMA. The effects would vary, depending on specific recreation management objectives within each RMA. This is because RMA management under Alternative C would focus on providing users with quality recreation opportunities; however, it would in general maintain or have neutral effects on Back Country Byway-related interpretive opportunities in those areas.

Effects under Alternative D

The BLM would not designate any Back Country Byway under Alternative D.

Effects under Alternative E

Effects from recreation management on Back Country Byway would be similar to Alternative B. The exception would be effects from RMAs, which would apply to an additional 23 miles of the Fort Churchill to Wellington Back Country Byway.

Back Country Byway: Effects from Comprehensive Travel and Transportation Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

The BLM would continue to manage 80 percent (3,840,300 acres) of the planning areas as open to cross-country motorized travel. Thus, Alternative A would result in the most impacts on Back Country Byway. These include long-term effects on Back Country Byway interpretive opportunities from the creation of new linear features (e.g., two-tracks) throughout the landscape. New linear features would degrade the visual quality of the landscape, thereby altering interpretive opportunities along the Fort Churchill to Wellington Back Country Byway.

Effects under Alternative B

Alternative B would limit motorized and mechanized travel to existing routes across 4,677,000 acres of the planning area. Compared to Alternative A, CTTM under Alternative B would minimize the creation of new linear features and therefore preserve Back Country Byway-related landscape viewing and interpretive opportunities. However, limiting travel to existing routes could increase the volume of traffic on the Back Country Byway. This could make the byways more congested and limit the availability of public interpretation opportunities.

Effects under Alternative C

Effects on Back Country Byway from CTTM would be similar to Alternative B, but with effects applicable only to the Marietta and New Pass to Hawthorne Back Country Byway.

Effects under Alternative D

The BLM would not designate any Back Country Byway under Alternative D.

Effects under Alternative E

Effects on Back Country Byway from CTTM would be the same as Alternative B.

Back Country Byway: Effects from Lands and Realty

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would continue to manage most of the planning area as open to new ROW development. This includes areas next to the Fort Churchill to Wellington Back Country Byway. Therefore, the likelihood of new ROWs, such as transmission lines, pipelines, or roads, altering the unique visual and historic characteristics along the Fort Churchill to Wellington Back Country Byway would be greatest under this alternative.

Effects under Alternative B

Compared to Alternative A, management would decrease the potential for impacts from new ROW development along Back Country Byway routes. Under Alternative B, 28 miles (93 percent) of the Fort Churchill to Wellington Back Country Byway and 35 miles (32 percent) of the New Pass to Hawthorne Back Country Byway would cross ROW avoidance areas. Another 3 miles of the New Pass to Hawthorne Back Country Byway would cross ROW exclusion areas. Avoiding or excluding new ROW development would minimize changes to the unique visual and historic qualities of the Fort Churchill to Wellington and New Pass to Hawthorne Back Country Byway. This would preserve all types of interpretive opportunities along these routes.

The BLM would manage areas next to the Marietta Back Country Byway as open to ROW development. New ROWs would change the visual characteristics of the Marietta Back Country Byway. They also would conflict with management objectives, such as highlighting the area's wild horse and burro range, and unique landscape features, such as Teals Marsh.

Effects under Alternative C

Alternative C would exclude new ROW development along 8 miles (20 percent) of the Marietta Back Country Byway and 12 miles (17 percent) of the New Pass to Hawthorne Back Country Byway. Within ROW exclusion areas, Alternative C would preserve the unique Back Country Byway characteristics along these route segments. Outside of ROW exclusion areas, Alternative C would continue to manage areas along Back Country Byways as open to new ROWs. In these areas, new ROWs would affect Back Country Byway management by changing the visual and historic characteristics for which the

Marietta and New Pass to Hawthorne Back Country Byway would be designated.

Effects under Alternative D

The BLM would not designate any Back Country Byway under Alternative D.

Effects under Alternative E

Compared to Alternative A, management under Alternative E would decrease the potential for impacts from new ROW development along the Fort Churchill to Wellington route and the New Pass to Hawthorne route. Three (3) miles (3 percent) of the New Pass to Hawthorne Back Country Byway and 14 miles (47 percent) of the Fort Churchill to Wellington Back Country Byway would cross ROW avoidance areas. Another 37 miles (33 percent) of the New Pass to Hawthorne Back Country Byway would cross ROW exclusion areas. Avoiding or excluding new ROW development would reduce the potential for changes to the unique visual and historic qualities along these Back Country Byway. The effects on the Marietta Back Country Byway from lands and realty would be the same as Alternative B.

Back Country Byways: Effects from Renewable Energy

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

This alternative has the most potential for wind and solar energy development to impact the unique visual, cultural, and historic features along the Fort Churchill to Wellington Back Country Byway. All areas surrounding the 33-mile route would be open to wind energy development; 7 miles (21 percent) of the route would pass through a solar energy variance area.

Effects under Alternative B

Along the Fort Churchill to Wellington Back Country Byway, Alternative B would decrease the potential for effects on Back Country Byway-related viewing and interpretive opportunities from wind and solar energy, compared to Alternative A. The route would not pass through any solar variance areas; a 13-mile segment would traverse a ROW avoidance area for wind. Impacts from wind energy development along the remainder of the route outside ROW avoidance areas would be the same as Alternative A.

Under Alternative B, 20 miles of the Marietta Back Country Byway and 40 miles of the New Pass to Hawthorne Back Country Byway would be within solar variance areas. The entire Marietta Back Country Byway and all but 19 miles of the New Pass to Hawthorne Back Country Byway would be outside wind ROW avoidance areas. Renewable energy development would impact Back Country Byway viewing settings along Back Country Byway routes. Impacts would be dependent on the size disturbance or the type of facility.

Effects under Alternative C

For the Marietta Back Country Byway, BLM management for renewable energy would provide the greatest protections of Back Country Byway-related viewing and interpretive opportunities by designating 8 miles of the Back Country Byway in ROW exclusion areas. For the New Pass to Hawthorne Back Country Byway, 1 mile would be within ROW exclusion areas and 3 within wind ROW avoidance areas. Managing ROW avoidance and exclusion areas would preserve unique visual, cultural, and historic features and the public's opportunity to interpret them. For Back Country Byway segments outside these ROW avoidance and exclusion areas, effects from renewable energy would be similar to Alternative B but would apply to fewer miles of Back Country Byways (see **Table 4-22**, Miles of Back Country Byways by Alternative). Nineteen (19) miles of the Marietta Back Country Byway and 42 miles of the New Pass to Hawthorne Back Country Byway would be within solar variance areas, which could result in more solar development than would occur under Alternative A.

Effects under Alternative D

The BLM would not designate any Back Country Byways under Alternative D.

Effects under Alternative E

Compared to Alternative A, lands and realty management under Alternative E would preserve Back Country Byway-related interpretive opportunities along the Fort Churchill to Wellington Back Country Byway. It would accomplish this by designating 13 miles of the route within ROW exclusion areas. Within the ROW exclusion area the potential for new wind and solar energy development and associated changes to the visual characteristics would be eliminated. Also, compared to Alternative A, four fewer miles of the route would pass through a solar variance area. This would reduce the potential for alterations to interpretive opportunities from solar energy development.

The effects on the Marietta Back Country Byway would be similar to Alternative B, with the exception that 5 fewer miles of the Back Country Byway would cross solar variance areas.

For the New Pass to Hawthorne Back Country Byway, Alternative E would provide the greatest protections of designated Back Country Byway characteristics and interpretive opportunities. It would accomplish this by managing 37 miles within avoidance areas for all ROW types, 5 miles within wind energy ROW avoidance areas, and 15 miles within ROW wind energy exclusion areas.

Back Country Byway: Effects from Areas of Critical Environmental Concern*Effects Common to All Alternatives*

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A, ACEC management would have no impacts on Back Country Byway. This is because the Fort Churchill to Wellington Back Country Byway would not pass through any currently designated ACECs.

Effects under Alternative B

Under Alternative B, 28 miles of the Fort Churchill to Wellington Back Country Byway would pass through the Namazii Wunu Cultural ACEC. By avoiding ROW development and promoting expanded educational opportunities along this portion of the byway, ACEC management would maintain or enhance opportunities for viewing and to interpret visual and cultural features highlighted by the Back Country Byway, compared to Alternative A.

Effects under Alternative C

Similar to Alternative A, ACEC management under Alternative C would not affect the Fort Churchill to Wellington Back Country Byway.

For a one-mile segment of the New Pass to Hawthorne Back Country Byway that would be within the Desatoya GRSG ACEC, proposed ACEC management would protect and maintain the historic elements within the viewing setting from new ROW, fluid minerals, and mineral disposal disturbance.

Effects under Alternative D

The BLM would not designate any Back Country Byway under Alternative D.

Effects under Alternative E

Similar to Alternative A, ACEC management under Alternative E would not affect the Fort Churchill to Wellington Back Country Byway. This is because neither the Marietta nor New Pass to Hawthorne Back Country Byway would pass through an ACEC under Alternative E.

Back Country Byway: Effects from Back Country Byways

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

The BLM would continue managing the Fort Churchill to Wellington Back Country Byway. The byway, which begins at the historic Fort Churchill east of Dayton, travels along the Carson River and through the Pine Nut Mountains before terminating at Wellington. Management of the byway would be to continue to highlight unique visual features (e.g., the Carson River), historic features (e.g., Fort Churchill, Pony Express trail, and Como Mining District), and geomorphologic features (e.g., Eldorado Canyon and Pine Nut Mountains). Back Country Byway management under Alternative A would continue providing interpretive opportunities along the Fort Churchill to Wellington Back Country

Byway; however, the BLM would not expand the Back Country Byway network by designating any other Back Country Byway.

Effects under Alternative B

Alternative B would rescind a 23-mile segment (3 miles on BLM-administered land) from Fort Churchill to Dayton and would manage the Dayton to Wellington Back Country Byway. This rescission would eliminate Back Country Byway-related opportunities to interpret unique features (e.g., Fort Churchill and the Carson River) otherwise available under Alternative A. Overall, by designating the Marietta and New Pass to Hawthorne Back Country Byway, Alternative B would result in a net 141-mile increase in Back Country Byway over Alternative A. The Marietta Back Country Byway would provide users with expanded environmental and historical interpretation and educational opportunities in the southern portion of the planning area by highlighting the Candelaria Mining District, Teals Marsh, and Marietta Wild Horse and Burro Range. The New Pass to Hawthorne Back Country Byway would increase interpretation opportunities of Nevada's western heritage (e.g., livestock ranching) and unique visual landscapes (e.g., Basin and Range geomorphology).

Additional Back Country Byway management would promote the Marietta and New Pass to Hawthorne routes. It would do this via various outreach methods and partnering with other organizations to provide road signs, kiosks, and ongoing maintenance. Therefore, Alternative B would increase the public's opportunity to use these routes and to interpret their unique features. Upgrading signs where needed along the 30-mile Fort Churchill to Wellington Back Country Byway would also improve public understanding of key features, compared to Alternative A.

Effects under Alternative C

Back Country Byway management would rescind the entire Fort Churchill to Wellington Back Country Byway and would remove all Back Country Byway-related signs. It would eliminate all Back Country Byway-related interpretive and environmental education opportunities previously available along that route.

Compared to Alternative A, management under Alternative C would increase Back Country Byway-related interpretive opportunities. It would accomplish this by designating the 41-mile Marietta Back Country Byway and 71-mile New Pass to Hawthorne Back Country Byway, a net 79 mile increase in Back Country Byways, compared to Alternative A. For the Marietta Back Country Byway, Alternative C would provide the most interpretive opportunities in terms of miles of routes.

Effects under Alternative D

Alternative D would reduce Back Country Byway-related interpretive opportunities more than any other alternative by rescinding the Fort Churchill to Wellington Back Country Byway and not designating any new Back Country

Byways. There would be no Back Country Byway-related interpretive opportunities under Alternative D.

Effects under Alternative E

Effects of Back Country Byway management would be the same as Alternative B, with the exception that BLM management to mitigate user conflicts would enhance interpretive opportunities along the Fort Churchill to Wellington Back Country Byway.

Back Country Byway: Effects from National Trails

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

The Fort Churchill to Wellington Back Country Byway and Pony Express NHT would occupy the same route from Fort Churchill to Dayton. Management of the trail for public interpretation opportunities would support the Back Country Byway same objectives. NHT management would have no effect on the portion of the route from Dayton to Wellington.

Effects under Alternatives B, C, D, and E

No Back Country Byway would share a common route with an NHT under Alternative B; therefore, NHTs would not affect Back Country Byway.

Back Country Byway: Effects from Back Country Wildlife Conservation Areas

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternatives A, B, D and E

No Back Country Byway would cross BCWCAs, so they would not be affected by BCWCAs management.

Effects under Alternative C

The New Pass to Hawthorne Back Country Byway would run next to or bisect the Gabbs Valley Range North, Gillis West, and Gillis East BCWCAs. Management of these areas, which would be to preserve wildlife habitat, would also provide the opportunity for wildlife interpretation and education opportunities along the Back Country Byway.

Back Country Byway: Effects from Interpretation and Environmental Education

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

No interpretation and environmental education management actions are proposed under Alternative A and therefore would not impact Back Country Byway

Effects under Alternative B

Proposed management under Alternative B would benefit Back Country Byway by enhancing education and interpretive opportunities of BLM-administered resources, including for those unique features found along Back Country Byway routes.

Effects under Alternative C

Effects would be similar to Alternative B but would apply only to the Marietta and New Pass to Hawthorne Back Country Byway routes.

Effects under Alternative D

The BLM would not designate any Back Country Byway under Alternative D.

Effects under Alternative E

Effects on Back Country Byway from interpretation and environmental education under Alternative E would be the same as Alternative B.

Back Country Byway: Effects from Facilities and Transportation Maintenance

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Maintaining Back Country Byway-related facilities, such as kiosks and signs, would maintain interpretive opportunities along the Fort Churchill to Wellington Back Country Byway.

Effects under Alternative B

Maintaining Back Country Byway-related facilities, such as kiosks and signs, would maintain interpretive opportunities along the Fort Churchill to Wellington, Marietta, and New Pass to Hawthorne Back Country Byway routes.

Effects under Alternative C

Alternative C would rescind the Fort Churchill to Wellington Back Country Byway designation. Effects on the Marietta and New Pass to Hawthorne Back Country Byway would be the same as Alternative B.

Effects under Alternative D

The BLM would not designate any Back Country Byway under Alternative D.

Effects under Alternative E

Effects on Back Country Byway from facilities and transportation maintenance would be the same as Alternative B.

Back Country Byways: Cumulative Effects

Cumulative impacts on Back Country Byways are the result of past, present, and reasonably foreseeable future actions that increase or decrease opportunities to interpret unique features of Nevada's landscape that are visible from the byway route. Opportunities for interpretation are a direct function of total Back Country Byway route miles, which vary by alternative, as well as the likelihood that the unique features available for interpretation will change over time. In general, resource protection preserves interpretive opportunities while resource uses diminish those opportunities. However, where the unique landscape feature being highlighted is a resource use (e.g., livestock grazing or mineral development), resource protection could affect interpretive opportunities of that feature.

Because there would be no Back Country Byway under Alternative D, incremental cumulative effects on Back Country Byway apply only to Alternatives A, B, C, and E. Under these alternatives, effects would vary based on the unique features being highlighted by the Back Country Byway and the length and locations of the Back Country Byway routes.

Trends indicate that the number of wildfires will continue to gradually increase based on climate, conversion of habitat to areas dominated by invasive species, and increased potential for human-caused fires due to population growth and recreation use increases. An increase in wildfires would increase the potential for fires along Back Country Byway routes, which could result in damage to viewsheds and interpretation opportunities. ESR of areas that wildfires have burned would continue based on the number of acres burned. ESR treatments would continue to be prioritized to provide for human life and safety, soil/water stabilization, special status species habitat restoration, and invasive plant deterrence. This would help prevent long-term impacts on national trail resources from wildfires.

Incremental effects from climate change, wildfires, and invasive weeds would occur under all alternatives. However, the effects would be the most impactful on Back Country Byway under Alternative A. This is because this alternative would provide the fewest and most outdated management actions to protect the unique visual, cultural, and historic features. Alternatives B, C, and E would provide varying levels of management to address these threats and would result in fewer impacts on Back Country Byway.

Mineral development will continue to occur on both federal and nonfederal mineral estate lands within the planning area. These actions have altered and will continue to alter the landscape surrounding Back Country Byway and to affect opportunities to interpret features along those routes. Mineral exploration and

development is expected to continue for locatable minerals, fluid minerals, nonenergy mineral leasing, and mineral material disposables. There are approximately 23 plans of operations for explorations (greater than 5 acres) or mining currently administered, 148 fluid mineral leases, and 260 contracts for free-use permits for salable mineral operations (BLM 2013f). NSO stipulations, closures, and VRM objectives would decrease incremental impacts according to the specific management under each alternative. Under Alternatives B, C, and E, which highlight historic mineral activity along the Marietta Back Country Byway, restrictions on new mineral development would serve to protect the old mining developments and other unique features available for interpretation along that route.

CTTM actions that would close areas to motorized travel could reduce interpretive opportunities along Back Country Byway for users other than those on nonmotorized means, while preserving unique visual features from degradation due to the creation of new linear features. In areas open to motorized travel, there would continue to be the potential for motorized activities to degrade the unique features available for interpretation along Back Country Byway routes.

Use of BLM-administered lands for livestock grazing and wild horses and burros is anticipated to continue with localized increases and decreases in use. While livestock and wild horses and burros could conflict with Back Country Byway interpretive objectives, these uses are unique features of Nevada's past and will continue to be highlighted by Back Country Byway management. Therefore, maintaining or increasing livestock and wild horse and burro activity would support most Back Country Byway objectives.

Increasing use by the BLM of social media and Web-based resources will allow the public to better understand the unique features available for interpretation along Back Country Byway routes. Use of these technologies is expected to incrementally benefit Back Country Byway users over time.

4.5.3 Back Country Wildlife Conservation Areas

The Theodore Roosevelt Conservation Partnership, Coalition for Nevada's Wildlife, and Nevada Bighorn's Unlimited have requested that 9 areas, totaling 817,800 acres on BLM-administered lands within the planning area, be managed as Back Country Wildlife Conservation Areas (BCWCAs). They are as follows:

- Gillis West (42,500 acres)
- Gillis East (63,900 acres)
- Gabbs Valley Range North (50,800 acres)
- Gabbs Valley Range South (154,400 acres)
- Pilot Mountains (93,700 acres)

- Excelsiors (125,800 acres)
- Fairview (131,400 acres)
- Sand Springs (53,700 acres)
- Clan Alpine (101,600 acres)

Lands considered to be managed as BCWCA were identified with the following characteristics:

- Intact and undeveloped identifiable area
- Important fish and wildlife habitat
- Dispersed recreation opportunities, such as hunting and fishing
- Large enough to support conservation, maintenance, restoration, and enhancement of the natural habitats and ecosystem

Summary

Actions for managing and designating areas as BCWCAs apply under Alternative C only. Under Alternative C, implementing BCWCAs and the actions outlined for management of these areas would provide additional protection of wildlife habitat and dispersed recreation opportunities.

Methods of Analysis

Direct impacts on BCWCAs are considered to be those that either impair or enhance the values for which the BCWCA was proposed. Also analyzed were impacts on these values from either the creation of the BCWCA or, where an BCWCA is not proposed, the management actions for other resources. All impacts discussed are direct, though some may not occur immediately after implementation of management actions. The analysis in this section focuses on specific threats to the characteristics identified for BCWCAs. Actions for managing and designating areas as BCWCAs apply under Alternative C only. Therefore, impacts associated with management of vegetation, fish and wildlife, special status species, wildland fire ecology, livestock grazing, geology and minerals, recreation and visitor services, comprehensive travel and transportation management, and lands and realty are only assess for Alternative C. All other effects would be common to all for those resources.

Assumptions

The following assumptions were used to assess the impacts on BCWCAs:

- Although management actions for most resources and resource uses have district office-wide application, BCWCA management applies only to those lands within the BCWCAs.
- Areas will be kept open to hunting, fishing, trapping and other outdoor recreation, and the Nevada Department of Wildlife retains management authority over fish and wildlife populations.

- Travel management decisions will consider access to BCWCAs and attempt to maintain the existing dispersed nonmotorized recreation in these areas.

Management for the following resources would not result in an effect on BCWCAs: air quality, climate management, soil and water resources, wild horse and burros, cultural resources, paleontological resources, visual resources, caves and cave resources, forestry and woodland products, renewable energy, ACECs, Back Country Byways, national trails, WSRs, WSAs, tribal interests, public health and safety, and interpretation and environmental education.

Indicators

The following indicators were used to assess the degree of these impacts on BCWCAs:

- Surface disturbance activities that alter the range and dispersal of fish and wildlife species within the BCWCA through fragmentation of habitat and introduction of nonnative invasive species
- Activities that decrease opportunities for native plant and animal species to thrive within the ecosystem, while maintaining sustainable population numbers
- Activities that alter the quality of dispersed recreation, such as backpacking, camping, fishing, hiking, hunting, and horseback riding

Nature and Type of Effects

Effects on BCWCAs include any actions that increase wildlife habitat fragmentation, wildfire, pinyon-juniper expansion, and introduction or establishment of invasive species. Impacts would also result from minerals or energy development, livestock grazing, ROW authorizations, and OHV use within BCWCAs that decrease the overall quality of the area. Removing native plant and animal species habitat or by altering the dispersed recreation experience would cause impacts. Management actions emphasizing resource protection (e.g., closure to motorized travel) could also reduce the intended purpose of BCWCAs if such actions would limit access to the BCWCA. However, closure of a large area to motorized travel may restrict the ease of access to some areas, but it would also protect habitat and closure of select routes to motorized travel to eliminate multiple routes would not have an impact.

The following sections discuss the effects from various resources on BCWCAs under Alternative C.

BCWCAs: Effects Common to All Alternatives

There are no similar effects among all alternatives. Actions for managing and designating areas as BCWCAs apply under Alternative C only; therefore, Alternatives A, B, D, and E were not evaluated.

BCWCAs: Effects from Fish and Wildlife

Under Alternative C, the reintroduction or augmentation of native wildlife would be supported. This action would positively impact animals and wildlife-related recreation opportunities within BCWCAs by maintaining healthy populations of native wildlife species. Nonnative, undesirable aquatic animal species (such as bullfrogs) would be removed from active native aquatic breeding grounds. This would protect fish and wildlife priority habitat by reducing the competition of native species with nonnative species.

BCWCAs: Effects from Special Status Species

Under Alternative C, 52,600 acres of PPMA would overlap BCWCAs. The BLM would manage for protection of PPMA and PGMA Sage-Grouse habitat in cooperation with the USFWS and NDOW on BCWCA lands. Management actions under Alternative C for protecting Sage-Grouse habitat are closing PPMA and PGMA to fluid mineral and mineral material disposal, imposing ROW exclusions, prohibiting motorized and mechanized travel, and closing areas to livestock grazing. The reduced surface disturbance from these actions would benefit BCWCAs by reducing habitat fragmentation, reducing potential for nonnative species establishment, and preserving the landscape for primitive types of recreation.

BCWCAs: Effects from Wildland Fire Ecology and Management

Under Alternative C, fire management actions would be implemented using strategies designed to mimic natural fire regime and enhance fish and wildlife habitat. These actions under Alternative C include applying minimum impact suppression tactics, whereby the environmental impacts of emergency fire management methods would be no greater than necessary to meet fire management objectives. The use of dozers would be authorized only when there is a threat to public safety or property damage. Chemical agents would not be allowed for suppression. These actions would help keep vegetation within BCWCAs native and would provide for high quality recreation.

BCWCAs: Effects from Livestock Grazing

Under Alternative C, livestock grazing in BCWCAs would be restricted to prescriptive grazing and would be authorized annually. Grazing would also be consistent with BLM-approved Sage-Grouse management guidance. These management actions would improve habitat for these species and would protect other species thriving near them.

BCWCAs: Effects from Geology and Minerals

Under Alternative C, BCWCAs would have an NSO stipulation for fluid minerals. This would generally provide the same level of protection as closing the area to leasing. This is because, while the mineral would still be available for extraction beneath the surface, facilities would be located outside of the designated boundaries. BCWCAs would also be closed to mineral material disposal and nonenergy mineral leasing. These stipulations and closures would

protect BCWCA from habitat fragmentation and allow for high quality recreation.

BCWCAs: Effects from Recreation and Visitor Services

Management of ERMA's could result in fewer impacts on BCWCAs due to the increased availability of recreation. Recreation impacts in these areas are largely dependent on the type of recreation that is utilized in the ERMA's. Such recreation as motorized vehicle use can allow for access within the BCWCA, but at the same time, cross-country travel can fragment habitat. Activities in these areas would likely be monitored more than areas lacking the recreation designation; therefore, impacts could be minimized through monitoring.

BCWCAs: Effects from Comprehensive Travel and Transportation Management

Travel and transportation management would affect BCWCA areas by addressing administrative and resource access needs to or within the BCWCAs. Specific actions would include designation of routes that allow for motorized access and the possible closure or limited use of routes to meet the overall management objective or implementation actions of the BCWCAs. Trail needs for nonmotorized uses such as hiking, biking or horseback riding within the BCWCA to manage resources, legal access, or provide recreational activities such as photography, camping, or hunting would also be addressed.

Limiting the construction of new roads as well as maintenance or rehabilitation of primitive roads and motorized trails would help reduce route density to conserve wildlife habitat and reduce habitat fragmentation.

BCWCAs: Effects from Lands and Realty

Under Alternative C, the BCWCAs would be managed as ROW exclusion, except within existing ROWs. This would protect the wildlife habitat and BCWCA characteristics.

BCWCAs: Effects from Areas of Critical Environmental Concern

Under Alternative C, 52,200 acres of the Clan Alpine BCWCA overlaps with a proposed ACEC area; 13,100 acres of the Gabbs Valley Range South BCWCA overlaps with proposed ACEC area. Where the BCWCA overlaps the ACEC, management could indirectly protect characteristics of the BCWCA due to the protective measures proposed for the ACEC. Management actions that protect habitat, such as PPMA for Greater Sage-Grouse, will potentially enhance the habitat for other wildlife species. These protective measures would aid management objectives for the BCWCA. They also would offer some indirect protection from habitat fragmentation due to the limitations of surface-disturbing activities on the ACEC, such as limits to mineral or lands and realty actions.

BCWCAs: Cumulative Effects

There were no past or present impacts on BCWCAs as these areas were not previously delineated. Past and present impacts relating to resource and multiple use management continues in landscapes where delineation of BCWCAs are proposed (Alternative C only)

Livestock grazing would continue, but it would be limited to prescriptive grazing in the BCWCAs under Alternative C. ROWs would be allowed only in existing ROWs. There would be limited minerals development due to the NSO for fluid minerals and closures for mineral materials and nonenergy minerals. Designation of priority wildlife habitat and watersheds, sensitive species management, and ACECs would restrict certain uses and minimize impacts on BCWCAs. Travel designations and limited fire suppression strategies would also minimize impacts on BCWCA. Potential impacts from motorized recreational activities, including OHV travel and permitted recreation events, would require stipulations to prevent impacts BCWCAs. Since permitted activities are low and remain on graded roads and washes, cumulative impacts from these activities are expected to be negligent. Since most of the BCWCAs fall within proposed ERMAs, impacts from OHV activity will be monitored and any potential impacts will be mitigated.

Overall, the incremental impacts on BCWCA would be low.

4.5.4 National Trails

This section discusses impacts on National Historic Trails (NHTs) and National Recreational Trails (NRTs) from proposed management actions of other resources and resource uses. Existing conditions concerning national trails are described in **Section 3.4.3, National Trails**. None of the alternatives substantially interfere with NHTs, and all are compatible with the nature and purpose of the NHTs.

Summary

The CCD has two congressionally designated historic trails and one congressionally designated national recreation trail. The California National Historic Trail, the Pony Express National Historic Trail, and the Grimes Point National Recreation Trail are shown on **Figure 3-18, Back Country Byways and National Trails**. The National Trails System is the network of scenic, historic, and recreation trails created by the National Trails System Act of 1968. These trails provide for outdoor recreation needs, promote the enjoyment, appreciation, and preservation of outdoor areas and historic resources, and encourage public access and citizen involvement. National historic trails are fragile nonrenewable evidence of recent human history and heritage on the landscape. They are public resources entrusted to the BLM for protection and interpretation, providing a context for present-day land use decisions.

NHTs are extended trails that closely follow a historic trail or route of travel of national significance. They are designated in order to protect the historic route

and its historic remnants and artifacts for public use and enjoyment (1968 National Trails System Act, Section 3[3]). National Recreation Trails (NRTs) provide a variety of outdoor recreation uses within or in reasonable access to urban areas (1968 National Trails System Act, Section 3[1]). Overall, objectives and actions associated with other resources that result in closure to surface disturbance activities near national trails would be beneficial due to reduced chance of disturbance to national trail features.

Management for the following resources would not result in an effect on national trails: air quality, soil and water resources, fish and wildlife, wild horses and burros, cultural resources, paleontological resources, caves and cave resources, forestry and woodland products, and WSRs.

Methods of Analysis

Methods and Assumptions

National trail baseline information in **Section 3.4.3**, National Trails, was reviewed for current understanding of known resources and to determine the condition of the resources. Also, all laws pertinent to determining effects on national trails (e.g., National Trails System Act, NHPA) were included in the criteria for determining impacts. This known information was overlain with the actions found under each alternative in Chapter 2. Then conclusions were drawn based on an understanding of how these types of actions may affect known and potentially discoverable resources.

This analysis includes the following assumptions:

- Congressional designation of a trail as part of the National Trails System signifies that the resource is of exceptional scenic, recreational, and historic value.
- National trails and related sites are protected in accordance with federal laws and BLM regulations and agreements.
- Impacts on the NHTs are assessed by applying the criterion of adverse effect, as defined in 36 CFR, Part 800.5a: “An adverse effect is found when an action may alter the characteristic of a historic property that qualify it for inclusion in the NRHP in a manner that would diminish the integrity of the property’s location, design, setting, workmanship, feeling, or association. Adverse effects may include reasonably foreseeable effects cause by the action that may occur later in time, be farther removed in distance, or be cumulative.”
- The BLM will follow 36 CFR Part 800, Section 106, and the Nevada State Protocol when addressing federal undertakings; therefore, adverse effects on the NHT will be appropriately mitigated.

- Degradation of the national trail from natural processes (e.g., erosion) will continue regardless of avoidance of human caused impacts.
- Potential impacts on an NHT and its setting from subsequent undertakings (implementation of the planning decisions or site-specific project proposals) require separate compliance with the NEPA and Section 106.

Indicators

Indicators of impacts on national trails are as follows:

- Management goals and objectives that conflict with sustaining national trail qualities
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the NHT's historic character or the surroundings of a national trail
- Loss of integrity and in some cases a loss of archaeological information, resulting from physical damage to or destruction of all or parts of an NHT
- Alterations to the level of public access to trail resources, which may increase use, erosion, looting, and vandalism
- A lack of action, which, in certain cases, can allow a trail resource to deteriorate
- Substantial interference with the values for which the components of the system were designated occurs
- Impacts on the resources, qualities, values, and associated settings of the BLM-administered lands through which such National Trails may pass, and the primary trail use or uses

Nature and Type of Effects

Indirect impacts on national trails result from project-induced increases or decreases in activity in the planning area. Intensification of such uses as grazing, ROW authorizations, and OHV use along or near national trails typically decrease overall trail quality. This is caused by changing the visual or historic character for which the trail was designated.

Direct impacts on national trails typically result from actions that disturb the soil or alter characteristics of the surrounding environment. These characteristics contribute to trail significance, introduce visual elements out of character with the property or alter its setting, or result in neglect of the resource to the extent that it is deteriorated or destroyed. For example, surface-disturbing activities that impact trail ruts for historic trails are considered a direct impact because the trail segments are nonrenewable. Direct impacts also include

actions that result in data collection and proactive preservation of NHTs and NRTs.

Proposed management that would encourage increased visitor use or construct recreation facilities may result in theft or vandalism of historic trail cultural resources. It also may damage the trail through increased use. Recreation in particular is a complex issue. This is because actions taken to preserve historic values can positively and negatively affect heritage tourism and trail enthusiasts.

Federal actions defined as federal undertakings under Section 106 of the NHPA require the identification, evaluation, and consideration of adverse effects and the appropriate mitigation of those effects. Nearly all implementation actions would be subject to further cultural resource review before site-specific projects are authorized or implemented. If adverse effects are identified, mitigation measures, including avoidance, would have to be considered to minimize or eliminate the effects.

National Trails: Effects from Climate Management

Effects Common to All Alternatives

The unique character of landscapes in the planning area will continue to change in response to such climatic factors as drought and extreme precipitation. Indirect effects on national trails from climate change would occur from increased wildfire potential, flooding, and other events capable of altering the overall character of the landscape and the public's ability to interpret key features along the route.

Effects under Alternative A

Climate-related landscape changes surrounding the California NHT, the Pony Express NHT, and the Grimes Point NRT would continue and would steadily alter the unique landscape of the area surrounding the national trails.

Effects under Alternative B, C, D, and E

Climate change management under Alternatives B through E would aim to preserve ecosystem functions. They would accomplish this by identifying and mitigating threats from climate change through adaptive management, thereby protecting opportunities to interpret unique features along the national trails.

National Trails: Effects from Water Resources

Effects Common to All Alternatives

Management of water resources would not affect the Grimes Point NRT.

Effects under Alternative A

Management of water resources under Alternative A would restrict development and disposal of lands within 100-year floodplains and would eliminate OHV use through or near surface water bodies. It also would

preserve the current character of the Carson River, which runs along parts of the California NHT and the Pony Express NHT.

Effects under Alternative B, C, D, and E

Management under Alternative B through E, which would prioritize acquisition of water rights and land acquisition to maintain stream flows, would preserve the unique character of the landscapes surrounding NHTs.

National Trails: Effects from Vegetation Resources

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Management actions for vegetation resources would maintain or improve the condition of rangelands and riparian habitats, reduce soil erosion, and maintain a diverse vegetation habitat for livestock, wild horses and burros, and wildlife. It also would maintain the character of the landscape surrounding NHTs and NRTs.

Effects under Alternative B

Management under Alternative B would maintain healthy landscape conditions surrounding national trails and would restore the most sagebrush habitat through pinyon-juniper removal than any other alternative. Further management that would allow for the removal of fire-killed and invasive trees, prevent invasive plant species, and protect riparian areas would subsequently preserve the scenic character of landscapes next to national trails.

Effects under Alternative C

The effects of vegetation resources management on the national trails are similar to those under Alternative B, but with 82 percent less area identified for pinyon-juniper removal.

Effects under Alternative D

The BLM would manage vegetation for the removal of pinyon-juniper; therefore, it would not protect the character around national trails from pinyon-juniper encroachment.

Effects under Alternative E

The effects of vegetation resource management on national trails are similar to those under Alternative B, but with 57 percent less area identified for pinyon-juniper removal.

National Trails: Effects from Special Status Species Management*Effects Common to All Alternatives*

Measures to protect special status fish and wildlife and their wildlife habitats include a variety of restrictions, buffers, closures, and structure height limits. These actions would limit activities that are incompatible with maintaining special status species. They also could indirectly reduce the potential for disturbance of national trails and their accompanying setting by reducing the potential for visual interference and noise.

Under all alternatives, the Grimes Point NRT would not intersect Greater Sage-Grouse PPMA or PGMA; therefore, it would not be affected by Sage-Grouse habitat management.

Effects under Alternative A

Management of special status species would not provide for any additional land use restrictions that would reduce the possibility of impacts on national trails.

*Effects under Alternative B*Greater Sage-Grouse

Greater Sage-Grouse habitat management would manage PPMA (275,600 acres) with CSU stipulations for fluid mineral leasing and as ROW avoidance areas.

PPMA does not intersect the California NHT, but it would intersect 3,600 acres of the Pony Express NHT; therefore, it would limit fluid mineral and ROW development in these areas. Management of special status species under Alternative B would provide for more protection of NHTs and their settings than Alternative A.

*Effects under Alternative C*Greater Sage-Grouse

Alternative C would close Greater Sage-Grouse PPMA and PGMA (414,200 acres) to fluid mineral leasing, nonenergy mineral leasing, and mineral material disposal. In addition, these areas would be managed as ROW exclusion areas.

PPMA and PGMA would intersect 3,600 acres of the California NHT and 47,700 acres of the Pony Express NHT. This would restrict mineral and ROW development in these areas. Management of Sage-Grouse habitat under Alternative C would provide the most protections to NHTs and their settings.

*Effects under Alternative D*Greater Sage-Grouse

Under Alternative D Greater Sage-Grouse habitat management would apply NSO stipulations for fluid mineral leasing within PPMA (275,600 acres), with no

exceptions, modifications, or waivers. Alternative D would apply NSO stipulations for fluid mineral leasing within PGMA (138,600 acres), with exceptions, modifications, and waivers, as outlined in **Appendix C**. It would manage PPMA and PGMA as ROW avoidance areas (414,200 acres).

PPMA would not intersect the California NHT under Alternative D but would intersect 3,600 acres of the Pony Express NHT. PGMA would intersect 200 acres of the California NHT and 400 acres of the Pony Express NHT. Due to the provision of NSO stipulations, Alternative D would be more protective of NHTs and their setting than Alternative A.

Effects under Alternative E

Greater Sage-Grouse

Greater Sage-Grouse habitat management under Alternative E would be similar to that described under Alternative D. In addition to the management actions under Alternative D, Alternative E would close PPMA and PGMA to nonenergy mineral leasing and mineral material disposal.

PPMA would not intersect the California NHT but would intersect 17,500 acres of the Pony Express NHT. PGMA would intersect 2,000 acres of the California NHT and 2,100 acres of the Pony Express NHT. Alternative E would be more protective of NHTs and their settings than Alternative A.

National Trails: Effects from Wildland Fire Ecology and Management

Effects Common to All Alternatives

Wildland fire could result in direct disturbance or loss of sites associated with national trails through the destruction or modification of structures, features, and artifacts (Tratebas et al. 2004; Greer and Greer 2001; Buenger 2003). Organic materials are especially vulnerable to heat damage.

Fire management would involve ground-disturbing activities that could also directly affect the national trail's footprint and associated sites by erasing the trail ruts and altering the spatial relationships within archaeological sites. The removal of vegetation increases the visibility of archaeological remains, resulting in artifacts becoming more susceptible to unauthorized collection, vandalism, and subsequent erosion. Effects from prescribed fire would be similar to those of wildland fire. However, prescribed fire is subject to project-level analysis and Section 106 process. Any effects could be mitigated to prevent adverse effects on the national trails or associated sites.

Effects under Alternative A

The BLM would continue to manage wildfires according to a four-tier system. Outdated management and lack of specific fire and fuels management objectives and actions would increase the likelihood for fire-related effects on the landscape surrounding national trails.

Effects under Alternative B

A full range of fire management activities and options would be used to protect all identified values at risk, as identified in the regularly updated fire management plan for the district. Fire suppression would reduce the potential impact on NHTs and NRTs from wildland fires, but it may increase the risk of impact from fire suppression tools and equipment.

After a fire, Alternatives B through E would implement emergency stabilization and burned area rehabilitation projects. These would stabilize soils, reestablish hydrologic function, maintain and enhance biological integrity, promote plant resiliency, limit expansion or dominance of invasive species, and reestablish native species. Rehabilitation and restoration of burned areas, which includes preventing cheatgrass and other invasive species, would restore the scenic and historic conditions around national trails after fires. This would minimize long-term effects following fires.

Effects under Alternative C

Minimum impact suppression would apply so that emergency fire management methods would be no greater than necessary to meet fire management objectives. Alternative C would limit the use of dozers for fire management. They would be used only when there is a threat to public safety or property damage and chemical agents would not be allowed for suppression. These limits to suppression could put NHTs, NRTs, and their surroundings at a greater risk of impact from wildland fire; but these areas would be at less of a risk for impact from fire suppression. However, Alternative C would protect sensitive cultural resources from catastrophic impacts of wildfire and wildfire suppression. Emergency stabilization and burned area rehabilitation would have the same objectives as Alternative B.

Effects under Alternative D

A full range of fire management activities and options would be used to protect all identified values at risk, as identified in the regularly updated fire management plan for the district. Fire suppression would reduce the potential impact on NHTs and NRTs from wildland fires; however, it may increase the risk of impact from fire suppression tools and equipment. All identified WUI values at risk would be protected from catastrophic impacts of wildfire and wildfire suppression. Emergency stabilization and burned area rehabilitation would occur with the same objectives as Alternative B.

Effects under Alternative E

The effects of Wildland Fire Ecology and Management on national trails are similar to those under Alternative B.

National Trails: Effects from Visual Resources Management*Effects Common to All Alternatives*

VRM Class I and II designations protect cultural resources where visual setting contributes to the significance of the property or the traditional use, such as NHTs. Using the visual resource contrast rating system during project planning could reduce the impact of visual intrusions on NHTs. Visual intrusion on the setting of NHTs must be considered in the Section 106 process, regardless of VRM designation.

Class I. The objective of this class is to *preserve* the existing character of the landscape. This class provides for natural ecological changes with very limited management. The level of change by the activity to the characteristic landscape should be very low and must not attract attention.

Class II. The objective of this class is to *retain* the existing character of the landscape. The level of change to the characteristic landscape should be low. Management may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the landscape.

Under all alternatives, the Grimes Point NRT would not be impacted by visual resource management.

Effects under Alternative A

Alternative A would not provide specific management for NHTs under VRM management; therefore, VRM management would not indirectly protect these resources.

Effects under Alternative B

Alternatives B through E would designate NHTs as VRM Class II areas. This means they would retain the existing character of the landscape and management would be limited so as not to attract the attention of the casual observer. Alternative B would manage the VRM Class II classification with a 0.25-mile buffer from the centerline of the historic trails.

In addition, under Alternatives B through E, management would classify WSAs as VRM Class I. This classification intersects 1,000 acres of the Pony Express NHT. It would preserve the existing character of the landscape and would allow for very limited management.

Effects under Alternative C

Alternative C would manage NHTs similar to Alternative B. VRM Class II would have a 2.5-mile buffer from the centerline of the historic trails, which would be the greatest buffer of all the alternatives. WSA Class I management would intersect 1,200 acres of the California NHT and 22,500 acres of the Pony

Express NHT. This is the greatest acreage of VRM Class I intersection with NHTs of all the alternatives.

Effects under Alternative D

Alternative D would manage NHTs and WSA VRM classification and management just as Alternative B would.

Effects under Alternative E

Alternative E would manage NHTs similar to Alternative B. It would manage VRM Class II with a 1-mile buffer from the centerline of the historic trails. This is more than Alternative A. WSA Class I management would not intersect the California NHT but would intersect 6,600 acres of the Pony Express NHT, more than under Alternative A.

National Trails: Effects from Livestock Grazing Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

The California NHT, Pony Express NHT, and Grimes Point NRT would continue to cross areas that are available for livestock grazing; they would be managed according to existing use levels. Concentrated livestock grazing use in localized areas would result in eroded soil, vegetation cover reduction, and other landscape changes that would affect NHT and NRT.

Effects under Alternative B

Areas along the NHTs and NRT currently managed as available for livestock grazing would continue to be managed as such according to existing use levels. Management, such as prescriptive grazing for vegetation management and prohibitions on continuous year-round grazing, would decrease the likelihood of long-term impacts on the visual and historic quality of the landscape.

Effects under Alternative C

Compared to Alternative A, the BLM would manage 45 percent fewer acres as available for livestock grazing under Alternative C. Benefits of reduced grazing on national trails would include less potential for long-term aesthetic changes from overgrazing.

Effects under Alternative D

Effects from livestock grazing management on national trails would be the same as described under Alternative B.

Effects under Alternative E

Effects from livestock grazing management on national trails would be the same as described under Alternative B.

National Trails: Effects from Geology and Mineral Management*Effects Common to All Alternatives*

The Grimes Point NRT is on lands withdrawn to the Bureau of Reclamation but is managed by the BLM under a memorandum of understanding with the Bureau of Reclamation. Reclamation withdrawal effectively closes the area to anything other than Reclamation uses, so the trail is effectively closed to energy development. Recreational values would be protected under all alternatives.

Effects under Alternative A

Management of mineral development would not provide specific management for national trails or actions for reclamation subsequent mining activities. Mining would continue be a long-term visual feature on the landscape. However, trail designation would prevent damage to the fragile, nonrenewable evidence of recent human history and heritage features associated with the trails.

Effects under Alternative B

Alternative B would manage the California NHT as follows: closed to fluid mineral leasing along 1,100 acres, closed to nonenergy mineral leasing along 1,100 acres, and closed to locatable mineral entry along 2,000 acres. Additionally, 2,900 acres would be managed with CSU stipulations and 1,000 acres would be managed with NSO stipulations toward fluid mineral leasing. Alternative B would not limit mineral material disposal along the NHT; however, it would manage other areas of the NHT as open to all forms of mineral development. Other resource management, such as VRM, would further protect NHTs from mineral development.

Alternative B would manage the Pony Express NHT as follows: closed to fluid mineral leasing along 1,000 acres, closed to nonenergy mineral leasing along 1,000 acres, closed to locatable mineral entry along 300 acres, and closed to mineral material disposal along 1,000 acres. Additionally, 11,200 acres would be managed with CSU stipulations and 600 acres would be managed with NSO stipulations toward fluid mineral leasing. Alternative B would manage other areas of the NHT as open to all forms of mineral development. Other resource management, such as VRM, would further protect NHTs from mineral development.

Alternative B would provide more restriction and closure to mineral material development than Alternative A, which would result in fewer changes to the landscape, affording a more historical viewshed for those using the trail. Trail designation would prevent undue impacts on the trails from mineral development.

Effects under Alternative C

Alternative C would manage the California NHT and the Pony Express NHT as closed to mineral development; it would not manage any areas as open to

mineral development. This would preserve the setting of the NHTs the best of all the alternatives.

Effects under Alternative D

Alternative D would manage the California NHT the same as Alternative B would, except it would manage 3,000 acres with a CSU stipulation toward fluid mineral leasing instead of 2,900 acres. Alternative D would manage the Pony Express NHT the same as Alternative B would, except it would manage 12,800 acres with a CSU stipulation toward fluid mineral leasing, rather than 11,200, and 4,300 acres with a NSO stipulation for fluid mineral leasing, rather than 600. These additional restrictions would preserve the setting of the trails more than Alternative A and B, but less than Alternative C.

Effects under Alternative E

Alternative E would manage the California NHT as follows: closed to fluid mineral leasing along 58,700 acres, closed to nonenergy mineral leasing along 58,700 acres, closed to mineral material disposal along 58,700 acres, and closed to locatable mineral entry along 9,300 acres. Alternative E would not manage any segments of the California NHT as NSO or CSU stipulations for fluid mineral leasing.

Alternative E would manage the Pony Express NHT as follows: closed to fluid mineral leasing along 120,400 acres, closed to nonenergy mineral leasing along 120,400 acres, closed to mineral material disposal alone 120,400 acres, and closed to locatable mineral entry along 2,000 acres. Alternative E would not manage any segments of the California NHT as NSO or CSU stipulations for fluid mineral leasing.

Alternative E would provide more closure along NHTs to mineral development and thus preserve the historic setting along more segments of the trails than Alternatives A, B and D, but fewer than Alternative C.

National Trails: Effects from Recreation and Visitor Services

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Under Alternative E, a small portion of the Pony Express NHT would cross the Sand Mountain SRMA, which would be managed for historical interpretation. The Sand Mountain SRMA would be closed to nonenergy and fluid mineral leasing, and new ROW authorizations would be restricted to existing ROW corridors.

National Trails: Effects from Comprehensive Travel and Transportation Management

Effects Common to All Alternatives

Under all alternatives OHV and off road vehicle use can result in damage or desecration to the fragile, nonrenewable evidence of recent human history and heritage. Impacts can be limited by increasing restrictions on and around the NHTs and NRTs. Designations and restrictions to maintain the integrity of NHTs and NRTs will be considered and implemented in the development of the Comprehensive Travel Management Plan.

Effects under Alternative A

Under Alternative A, the lands surrounding NHTs would be undesignated/managed as open to motorized and mechanized travel management, resulting in the highest risk for damage of NHTs of all the alternatives.

Effects under Alternative B

Alternative B would manage the land surrounding NHTs as limited to designated routes. This would reduce the potential for damage to NHTs by restricting trail blazing and keeping OHV use to existing routes. However, impacts to NHTs could still occur if OHV users trail blaze over NHT corridors.

Effects under Alternative C

Alternative C would restrict access to mechanized travel only within a 2.5-mile buffer from the center line of the NHTs. This would eliminate the use of motorized vehicles on the trails. Alternative C would provide the greatest protection to NHTs from OHV use of all the alternatives.

Effects from Alternative D

The potential for impacts on NHTs from OHVs as a result of travel management under Alternative D would be the same as those described under Alternative B.

Effects from Alternative E

The potential for impacts on NHTs from OHVs as a result of travel management under Alternative E would be the same as those described under Alternative B.

National Trails: Effects from Lands and Realty*Effects Common to All Alternatives*

The Grimes Point NRT is on Bureau of Reclamation withdrawn lands but managed by the BLM under a memorandum of agreement with Bureau of Reclamation. If the BLM processes a relinquishment on the Bureau of Reclamation withdrawal, the lands would revert back to BLM management and the BLM would manage the trail. Impacts would be the same under all alternatives as the BLM is currently managing the trail under a memorandum of agreement.

Effects under Alternative A

Alternative A would allow ROW development throughout most of the planning area, including that next to the California NHT, the Pony Express NHT, and the Grimes Point NRT. Under Alternative A, the probability would be highest that new ROWs, such as transmission lines, pipelines, and roads, would alter the unique visual and historic characteristics along the national trails.

Effects under Alternative B

Compared to Alternative A, management under Alternative B would decrease the potential for impacts from new ROW development along NHTs. Under Alternative B, 9,500 acres of the California NHT and 28,700 acres of the Pony Express NHT would cross ROW avoidance areas. An additional 1,000 acres of the Pony Express NHT would intersect ROW exclusion areas. Avoiding or excluding new ROW development would minimize changes to the unique visual and historic qualities of NHTs.

Effects under Alternative C

Alternative C would exclude new ROW development along 94,500 acres of the California NHT and 144,000 acres of the Pony Express NHT. Additionally, Alternative C would manage 93,000 acres of the California NHT and 164,400 acres of the Pony Express as ROW avoidance areas. Compared to Alternative A, prohibitions on new ROWs under Alternative C would better preserve the unique NHT characteristics along these route segments. Alternative C would also provide more restriction and prohibitions on ROW development than Alternative B.

Effects under Alternative D

Effects of ROW management under Alternative D would be the same as those discussed under Alternative B.

Effects under Alternative E

Alternative E would exclude new ROW development along 6,600 acres of the Pony Express NHT. Additionally, Alternative E would manage 58,700 acres of the California NHT and 113,800 acres of the Pony Express as ROW avoidance areas. Compared to Alternative A, prohibitions on new ROWs under Alternative E would better preserve the unique NHT characteristics along these route segments. Alternative E would also provide more restriction and prohibitions on ROW development than Alternative B.

National Trails: Effects from Renewable Energy*Effects Common to All Alternatives*

NHTs would not be within solar variance areas; that is, utility-scale solar development around NHTs would be prohibited.

Effects under Alternative A

The potential for changes to the unique landscape characteristics surrounding the NHTs from wind energy development would be greatest under Alternative A. No segments of the NHTs would be managed as ROW avoidance or exclusion areas for wind energy development. New wind development along the NHTs would hinder the BLM's ability to meet its management objectives for that route.

Effects under Alternative B

Alternative B would decrease the potential for effects from wind energy development along the NHTs compared to Alternative A. Intersecting ROW avoidance areas for wind energy are 9,500 acres of the California NHT and 29,700 acres of the Pony Express NHT. Impacts from wind energy development along the remainder of the route outside ROW avoidance areas would be the same as Alternative A.

Effects under Alternative C

Alternative C would decrease the potential for effects from wind energy development along the NHTs compared to Alternative A. Intersecting ROW exclusion areas for wind energy are on 187,500 acres of the California NHT and 308,400 acres of the Pony Express NHT. Impacts from wind energy development along the remainder of the route outside ROW exclusion areas would be the same as Alternative A. Alternative C would manage the most NHT areas as wind energy ROW exclusion areas of all the alternatives.

Effects under Alternative D

Alternative D would decrease the potential for effects from wind energy development along the NHTs, the same as Alternative B would.

Effects under Alternative E

Alternative E would decrease the potential for effects from wind energy development along the NHTs compared to Alternative A. Intersecting ROW

avoidance areas for wind energy are 54,100 acres of the California NHT and 113,800 acres of the Pony Express NHT. In addition, 4,600 acres of the California NHT and 20,800 acres of the Pony Express NHT would be managed as ROW exclusion areas for wind energy development. Impacts from wind energy development along the remainder of the route outside ROW avoidance and exclusion areas would be the same as Alternative A. Alternative E would be the only alternative to manage for more ROW exclusion areas for wind energy development than Alternatives A, B, and D. It would also manage more acres as ROW avoidance areas for wind energy development than Alternative A.

National Trails: Effects from Areas of Critical Environmental Concern

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Under Alternative C, the Pony Express NHT would be managed as part of the Sand Springs Desert Study Area ACEC. The Sand Springs Pony Express Station and Pony Express NHT would be managed for historical interpretation, and the Sand Springs interpretive trail would be maintained.

This 50-acre ACEC would be designated to protect cultural resources. It would be closed to motorized and mechanized travel, recommended for withdrawal from mineral entry, and managed as a ROW exclusion area; vegetation collecting would not be permitted. Management of the Sand Springs Pony Express Station and the Pony Express NHT would be more protective within the ACEC than outside of it. This designation would not afford these protections for the Cold Springs Pony Express Station or for other segments of the Pony Express NHT.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

National Trails: Effects from National Trails

Effects Common to All Alternatives

The BLM would cooperate with the Oregon-California Trails Association and other partners to identify, record, and evaluate NHT segments and sites for

NRHP eligibility. It also would cooperate with the National Park Service, National Trails Centers, the National Pony Express Association, and other groups to implement projects related to the Pony Express and California Trail. Additionally, the scientific and historical studies of cultural landscapes, sites, historic trails, and other resources, including excavation, would be allowed by qualified researchers on a case-by-case basis within the Pony Express and California Trail corridors with authorization.

The California NHT would be managed with three eligible historic sites or route segments: the Fernley Ruts high potential historic site and the Mickey Canyon and Humboldt Sink to Carson high potential route segments. The Pony Express NHT would be managed with two high potential historic sites: the Cold Springs Station and the Sand Springs Station.

Effects under Alternative A

Management of NHTs would be similar to those described in *Effects Common to All Alternatives*. Congress designated the California and Pony Express NHTs without any specific management identified, other than general NHT management. This is to ensure the protection of the trail resources, their interpretation, and their appropriate public use and to maintain the NHT and associated sites in public ownership. Currently there is a self-guided interpretive trail with informational signs at the Sand Springs and Cold Springs Pony Express Stations, which would continue to be maintained under Alternative A.

California National Historic Trail

The Fernley Ruts high potential historic site would be managed under a historic preservation and access easement under all the alternatives. Alternative A would not provide for specific management of the high potential historic sites.

Pony Express National Historic Trail

Alternative A would designate appropriate sites for public use, would provide access and information for interpretation, and would promote visitation of the Cold Springs and Sand Springs Stations. Alternative A would maintain the self-guided interpretation and informational signs at the stations and would excavate, stabilize, and develop the stations as public interpretive sites.

Grimes Point National Recreation Trail

Under Alternative A, the Grimes Point trail would be designated with no specific management actions identified.

Alternative A would protect the NHTs and provide information for the public to interpret the setting and historical context of the NHTs.

Effects under Alternative B

General Management of NHTs

Alternatives B through E would manage NHTs to preserve their historic and scenic values and related cultural landscapes and viewsheds. Managing the related cultural landscapes and viewsheds would be an additional measure not included in Alternative A. Preserving the viewshed surrounding the NHTs can enhance the interpretive experience for people recreating on the NHTs. The NHTs would be evaluated for high potential historic sites and route segments for inclusion on the NRHP based on resource qualities, values, associated setting, and the primary uses identified.

Additionally, Alternatives B through E would manage NHTs to mitigate for direct and indirect adverse effects on eligible, unevaluated, or high potential route segments and associated sites through such means as avoidance, project redesign, data collection, interpretation, and public education. Also new audible and atmospheric effects would not exceed current levels, where feasible. These management measures would protect the setting of the NHTs and enhance the recreation aspect of them more than Alternative A.

Alternative B would pursue legal access for public visitation to trail segments. It would develop and enhance significant segments and sites by installing trail markers and trail traces, interpretive signs, and directional signs to trail segments from main roads. Alternative B would provide recreation opportunities consistent with the historic values of the NHTs. It would develop facilities for placement outside of the trail corridor, when feasible, to protect resources and provide for visitor safety. This would enhance the public's interpretation of the sites, but it also could put these sites at an increased risk of vandalism and theft by providing signs that would point out these resources.

Development Restrictions

Specific management actions pertaining to both NHTs under Alternative B are management as VRM Class II and as a ROW avoidance area within a 0.25-mile buffer on either side of the centerline. Alternative B would open the NHT corridors to mineral material sales and disposal, as long as actions were compatible with the VRM Class II designation and the historic values.

California National Historic Trail

Alternative B would manage the Fernley Ruts as Alternative A would. Alternative B would manage the Mickey Canyon and the Humboldt Sink to Dayton high potential route segments in order to protect their historic values. It would also mitigate actions that would adversely affect the NHT through such means as avoidance, project redesign, data collection, interpretation, and public education. This is similar to management discussed under General Management of NHTs.

Pony Express National Historic Trail

Under Alternative B, the Pony Express NHT would not have any additional management directives other than those prescribed generally for national trails (as described under General Management).

Grimes Point National Recreation Trail

The BLM would manage the 0.75-mile Grimes Point NRT to be consistent with the management designated by the Secretary of the Interior. The following management actions would be implemented: a management plan would be developed to include maintenance, interpretation, and monitoring of petroglyphs; at a minimum, trails would be inspected annually to document the integrity of the petroglyph art; interpretive trail markers would be maintained and brochures would be provided; site steward monitoring with the Nevada Rock Art Foundation or other similar group would continue; and the BLM would coordinate with the Fallon Paiute Shoshone Tribe and the Bureau of Reclamation for trail management.

Effects under Alternative C

General Management of NHTs

General management actions of NHTs are similar to those identified under Alternative B. In contrast, Alternative C would pursue legal access to protect the trail segments and would continue to support stewardship programs to monitor sites and assist with management. Alternative C would not specifically promote public use of the trails or enhance the significant segments and sites, as Alternatives B, D, and E would; this would reduce the public's ability to interpret the sites but may also decrease the potential for the trail to be damaged by theft or vandalism.

Alternatives C, D, and E would also provide the opportunity to develop facilities within trail corridors only when needed to protect the trail integrity and resources or to establish an NHT recreation retracement route. This would preserve the historical setting of the NHT more than Alternative A and B, but may decrease the ability of the public to interpret and recreate at the NHTs.

Development Restrictions

Specific actions pertaining to both NHTs under Alternative C are management as VRM Class II and ROW avoidance within a 2.5-mile buffer on either side of the centerline. This is greater than Alternative B. Under Alternative C, the BLM would limit new noise sources and would seek opportunities to reduce current noise levels. Alternative C would also close NHTs to nonenergy mineral leasing, mineral material disposal, and fluid mineral leasing within 2.5 miles of the centerline. Due to these restrictions and closures to development of ROW and minerals along the NHT corridors, Alternative C would be the most protective of NHTs of all the alternatives from development features on the surrounding landscape. Alternative C would most preserve the historic setting of the NHTs.

California National Historic Trail

Alternative C would manage the Fernley Ruts the same as Alternative A would but with enhanced protection measures, such as signs and fencing where appropriate. Alternative C would manage the Mickey Canyon and Humboldt Sink to Dayton NHT segments to protect their historic values; actions that would adversely affect the NHT would not be allowed.

Pony Express National Historic Trail

Under Alternative C, the Pony Express NHT would not be managed under any directives other than those prescribed generally for national trails (as described under General Management).

Grimes Point National Recreation Trail

The Grimes Point NRT would be managed as discussed under Alternative B.

Effects under Alternative D

General Management of NHTs

General management actions of NHTs are similar to those identified under Alternative B. In addition, Alternative D would continue to support stewardship programs and partnerships to lead trail tours, monitor sites, and generally assist with management, which would enhance public ability to interpret and recreate on the trails.

Alternatives C, D, and E would also provide the opportunity to develop facilities within trail corridors, only when needed to protect the trail integrity and resources or to establish an NHT recreation retracement route.

Development Restrictions

Specific management actions of NHTs under Alternative D would be the same as described under Alternative B.

California National Historic Trail

Alternative D would manage the Fernley Ruts the same as Alternative A would and would manage the Mickey Canyon and Humboldt Sink to Dayton high potential historic sites the same as Alternative B would.

Pony Express National Historic Trail

Under Alternative D, the Pony Express NHT would not be managed under any directives other than those prescribed generally for national trails (as described under General Management).

Grimes Point National Recreation Trail

The Grimes Point NRT would be managed as discussed under Alternative B.

Effects under Alternative E

General Management of NHTs

General management actions of NHTs are similar to those identified under Alternative D.

Development Restrictions

Specific management actions pertaining to NHTs under Alternative E include management as VRM Class II and as a ROW avoidance area within a 1-mile buffer on either side of the centerline. This buffer of restricted use is greater than under Alternatives A and, therefore, more protective of the setting of the NHTs.

Additionally, Alternative E would close high potential historic sites and high potential route segments along the NHT corridor to nonenergy and fluid mineral leasing. It would close mineral material disposal within a 1-mile buffer on either side of the centerline. The remainder of the NHT corridor would be open to such leasing and development as long as the actions are compatible with the historic values. Such restrictions and closures would provide more protection of NHTs than under Alternatives A.

California National Historic Trail

Alternative E would manage the Fernley Ruts the same as Alternative C. It would manage the Mickey Canyon and Humboldt Sink to Dayton high potential historic sites the same as Alternative B would.

Pony Express National Historic Trail

Under Alternative E, the Pony Express NHT would not have any additional management directives other than those prescribed generally for national trails (as described under General Management).

Grimes Point National Recreation Trail

The Grimes Point NRT would be managed as discussed under Alternative B.

National Historic Trails: Cumulative Effects

Past and Present Actions

Table 4-1 and **Section 4.2.2** list past, present, and reasonably foreseeable future actions. Past and present actions in the cumulative impacts analysis area impacting National Historic Trails include climate change, wildfire, livestock grazing, wild horse and burros, minerals exploration and development, renewable energy, and ROWs. Impact associated with these activities include direct disturbance to the trail or the trail setting.

Reasonably Foreseeable Actions

Reasonably foreseeable future actions are likely to have similar impacts on the past and present actions. Nevada's gross greenhouse gas emissions rose faster

than those of the nation as a whole, increasing 62 percent from 1990 to 2004, while national emissions rose 16 percent during the same period. As such, the effects of climate change on vegetation composition and erosion hazards on the national trail viewsheds is expected to continue.

Trends indicate that the number of wildfires will continue to gradually increase. This is based on climate, conversion of habitat to areas dominated by nonnative invasive species, and increased potential for human-caused fires due to population growth and increases in recreation. An increase in wildland fires increases the potential for fires within national trail routes, which could damage trail viewsheds and affect interpretation and associated cultural resources. ESR of areas that have burned would continue based on the number of acres burned. ESR treatments would continue to be prioritized to provide for human life and safety, soil and water stabilization, important habitat restoration for special status species, and preventing invasive plants from becoming established. This would help prevent long-term impacts on national trails from wildland fires.

The National Pony Express Association has a permit issued from the BLM Utah State Office to conduct annual rerides of the Pony Express National Historic Trail. Management of the trail would not affect the permit. During the period of the reride, increased use could locally impact historical resources and the historical setting.

Grazing pressure on rangelands from livestock and wild horses and burros is anticipated to continue, if not increase. There is interest in acquiring grazing permits as they become available. In addition, due to their proximity to expanding urban areas, some allotments may lose grazing acreage, which would ensure demand for areas that will remain available for livestock grazing. This may include allotments surrounding national trails.

Minerals, renewable energy, and lands and realty activities could result in surface disturbance and impact soils during construction of roads, drill pads, power lines, and facilities. Mineral exploration and development is expected to continue for locatable minerals, fluid mineral leasing, nonenergy mineral leasing, and mineral material disposal. Currently there are approximately 23 plans of operation for explorations (greater than 5 acres) or mining administered, 260 contracts for free-use permits for salable mineral operations, and 148 geothermal leases leased (BLM 2013f). Restrictions around national trails due to VRM classifications would reduce impacts on these resources.

Incremental Cumulative Impact – Combined Past, Present, Reasonably Foreseeable Actions – All Alternatives

Incremental cumulative impacts would be similar for all alternatives. Overall, incremental impacts on National Historic Trails would vary based on use restrictions, and the size and number of minerals and renewable energy developments and construction associated with ROW authorizations.

4.5.5 Wild and Scenic Rivers

This section discusses the impacts on Wild and Scenic Rivers (WSRs) from proposed management actions on other resources and resource uses. Within the planning area, the BLM has found three segments on the East Fork Carson River to be eligible and suitable for inclusion in the National Wild and Scenic Rivers System (NWSRS). However, beginning at the headwaters, the Forest Service administers most of the river corridor. The Forest Service would need to identify a suitability determination of these segments before the BLM could recommend these segments to Congress for designation. Existing conditions concerning WSRs are further described in **Section 3.4.4, Wild and Scenic Rivers**.

Summary

Alternatives A and C would provide the most protection for eligible or suitable WSR segments because all segments would be managed as either eligible or suitable. The BLM would take no action that would impair the free-flowing nature, tentative classification, or ORVs of the segments.

Alternative B would provide the least protection. This is because the three eligible segments along the East Fork Carson River would be determined to be not suitable for inclusion in the NWSRS and would be released from interim management protection. The East Fork Carson River Segments 1, 2, and 3 would be managed similar to adjacent reaches of the river. Although this segment would not be suitable for inclusion in the NWSRS, 400 acres are within the Carson Iceberg WSA. They would be managed as VRM Class 1, which would provide indirect protection to the areas that were identified as having scenic ORV. The other area segments, however, would be provided the least protection under Alternative B. It would provide the fewest opportunities for protection for the East Fork Carson River Segments 2 and 3 due to the surface-disturbing activities allowed.

Alternative D would provide a fair amount of protection for the segments along the East Fork of the Carson River determined to be suitable for inclusion in the NWSRS. It would accomplish this by restricting surface-disturbing activities and SRMA designations that overlap stream segments. Impacts would be similar to Alternative C; however, because the BLM would take a more active approach to land management and restoration, there is greater potential for impacts on recreational ORVs to be mitigated under this alternative.

Effects under Alternative E would be similar to Alternative D but to a lesser degree. This is because the area of overlapping protection would be reduced.

Management for the following resources would not result in an effect on WSRs: air quality, climate management, soil and water resources, vegetation, fish and wildlife, wild horses and burros, wildland fire ecology and management, cultural resources, paleontological resources, caves and cave resources, forestry and woodland products, livestock grazing, lands and realty, renewable energy, areas

of critical environmental concern, Back Country Byways, national trails, back country wildlife conservation areas, WSAs, tribal interests, public health and safety, and interpretation and environmental education.

Methods of Analysis

Methods and Assumptions

The methods and assumptions below were used to assess the impacts on WSRs. This analysis assumes the following:

- The Forest Service will make a suitability determination for the three segments of the East Fork Carson River already found eligible and suitable by the BLM.
- Until the Record of Decision for this RMP is adopted, all suitable stream segments under consideration for WSR designation will be managed under interim protective measures required by the WSR Act and BLM Manual 6400, Wild and Scenic Rivers – Policy and Program Direction for Identification, Evaluation, Planning, and Management (BLM 2012o). At that time, any stream segment not found suitable for inclusion in the NWSRS would lose its interim protection. This procedure and the interim protective measures will ensure that the values for which these river segments were found eligible and suitable are not compromised until Congress makes a decision regarding WSR designation.
- If WSR designation is not provided (i.e., if segments are found not suitable and released from further study under the WSR Act), provisions could still remain to protect these river corridors. This will be done under a combination of existing plans, policies, and actions proposed under the action alternatives of this RMP. These provisions protect streamside and riparian habitats, riparian and aquatic wildlife, water quality, and cultural and visual resources. The major difference between designation and nondesignation is the legislative and, thus, lasting protection afforded designated streams. Decisions in this RMP, however, affect suitability only; once a segment is determined suitable, only Congress can formally designate it as part of the NWSRS.
- The BLM will not permit any actions that would adversely affect the free-flowing nature, ORVs, or tentative classification of any of the segments, or would result in the reduction of water quality to the extent that it would no longer support the ORVs. As such, implementing the management actions will not adversely impact eligible or suitable segments. There would not be impacts from other resources with either eligible or suitable segments. Recognizing that, the analysis of impacts on eligible and suitable WSR stream segments includes an evaluation of where management

actions might be inconsistent with the tentative classification given to each suitable segment, as well as potential impacts on its ORVs or free-flowing nature.

- A withdrawal is an administrative designation made by the BLM that prohibits certain activities on the identified federal lands to protect the identified value. The BLM's determination of whether a stream segment is suitable could affect some of these withdrawals. This is especially the case with withdrawals that are designed to protect potential water storage and potential hydropower generation sites. If the BLM determines that a stream segment is suitable, the final management plan could recommend revocation of water storage- or hydropower-related withdrawals. In addition, Congress could require revocation of certain withdrawals if it were to designate a river segment. A VSR management plan created in accordance with designation could also include a recommendation for revocation of withdrawals.

Indicators

The following indicators were used to assess the degree of impacts on VSR quality: any potential change to the ORVs, tentative classification (i.e., wild, scenic, recreational), or free-flowing nature of the river segment or corridor area from its current state, as described in **Section 3.4.4**, Wild and Scenic Rivers, and the draft Wild and Scenic River suitability report (BLM 2013c).

The tentative classification and identified ORVs for each segment are summarized in **Table 4-23**, Summary of Wild and Scenic River Study Segments.

Documentation of the process used to determine suitability can be found in the draft Wild and Scenic River suitability report (BLM 2013c).

Table 4-23
Summary of Wild and Scenic River Study Segments

East Fork Carson River Segment¹	Tentative Classification	ORVs	Alternative Determined Eligible/Suitable
Segment 1	Wild	Recreation, scenic, fish	A, C, D, E
Segment 2	Recreational	Recreation, scenic, fish, geologic	A, C, D, E
Segment 3	Scenic ²	Recreation, scenic, fish, geologic	A, C, D, E

Source: BLM 2013c

¹Each segment along the East Fork of the Carson River considered in the alternatives will be managed within 0.25-mile of either side of the ordinary high water mark.

²Under Alternative D the tentative classification is Recreational.

Nature and Type of Effects

The potential impact on each stream segment depends on the ORVs identified for the segment and the tentative classification of the segment. Segments classified as recreational would allow for the greatest level of development in the study corridor, while segments classified as wild must remain relatively undeveloped. Segments classified as scenic fall in between recreational and wild segments, allowing a moderate amount of development within the study corridor. Because segments classified as recreational would allow development to the extent it is compatible with the protection of the identified ORVs, impacts on segments classified as wild or scenic are the focus of the analysis of impacts on the segments' classification. In the planning area, impacts on the tentative classification would come mostly from trail and road and mineral and energy development.

Properly functioning riparian/wetland vegetation communities provide soil stabilization, soil filtration, and diverse vegetation species. In turn, properly functioning riparian/wetland vegetation communities can provide protection for vegetation, fish, and wildlife ORVs. Uses in riparian/wetland vegetation that could degrade the riparian/wetland vegetation ORV include camping, livestock grazing, and trail development. These activities can also cause soil erosion and degrade water quality, potentially impacting the fish ORV.

Management actions that prohibit surface-disturbing activities, including ROW exclusion areas, in the WSR study corridor would provide some amount of protection for a number of ORVs, including fish, scenic, and geological, by keeping the ORVs intact. This would also ensure that the tentative classification of the area remains intact. Under Alternative C, the East Fork Carson River Segments 2 and 3 would be managed as ROW avoidance. This could still allow some ROW development, which would primarily impact scenic ORVs. It could also cause soil erosion, vegetation loss, and habitat fragmentation, which could impact wildlife, fish, and vegetation ORVs. Segment 1 has a tentative classification of Wild and therefore would be managed as a ROW exclusion area.

Managing the segments according to VRM Class I or II objectives would directly protect segments with a scenic ORV by requiring that alterations to the landscape be done so as not to dominate the viewshed. Alterations that could not be mitigated to reach the VRM class objective would not be permitted. Because most large-scale developments cannot meet VRM Class I or II objectives, managing to protect the scenic values of the planning area would generally preclude most large-scale developments. In turn, this would indirectly protect segments with geological ORV.

In general, livestock grazing leads to use of wetland and riparian habitats. Detrimental impacts on these habitats can occur when they are improperly managed; this can lead to stream bank alteration, water quality degradation,

erosion, loss of vegetative health, and increases in nonnative or upland vegetation. These effects, however, would be minimized due to such management actions as changes in stocking rate and the timing of grazing. These actions could mitigate impacts from livestock grazing on vegetation ORVs.

Under all alternatives, mitigation measures and BMPs to prevent impacts on wetland and riparian habitats would be implemented during fire suppression and fuels management. Use of retardant would be restricted within stream segments, protecting water quality. These restrictions would be implemented on all surface waters, including NWSRS-eligible streams. In general, these actions would protect the habitats that provide NWSRS-eligible segment ORVs. However, this limitation of fuels management and suppression can increase fuel loads; therefore, fires that do impact NWSRS-eligible segments could be larger or more severe.

WSR study segments could benefit from interpretation and environmental education that teaches users about the importance of protecting the ORVs and encouraging them to recreate in the area in ways that do not threaten the resources. In addition, conducting research to learn more about resources associated with or connected to the ORVs would result in a better understanding of how best to provide long-term protection. This could result in either direct impacts (where science and education are aimed directly at the ORV) or indirect impacts (where the ORV benefits or protection result from monitoring, research, or education programs aimed at other programs).

The alternatives vary from no action to an emphasis on resource use, an emphasis on conservation, an emphasis on BLM lands within the urban interface area, and an overall mix and variety of management actions. Each alternative results in different priorities for resource development. Some of these priorities on resource use are expected to impact WSRs more than others. Below is a comparison of the effects from each resource on WSRs under the five alternatives.

WSRs: Effects from Special Status Species Management

Effects Common to All Alternatives

Under all alternatives, the BLM would make recommendations or support recommendations to ensure adequate flows through the East Fork Carson River to support flow-dependent values, such as recreation and fish. This would enhance the free-flowing nature of the East Fork Carson River, as well as protect or enhance the recreational and fish ORVs by providing adequate flows for recreationists and fish habitat.

Effects under Alternative A

Under Alternative A, the BLM supports the reintroduction of Lahontan cutthroat trout by other agencies in suitable and historic habitat and streams and springs. These would be identified by the Nevada Department of Wildlife as

having the potential to support populations of Lahontan cutthroat trout and other threatened and endangered fish. This action would enhance and protect the fish ORV in the river by supporting native fish species populations.

Effects under Alternative B

Under Alternative B, eligible river segments would be determined not suitable for NWSRS. Special status species management would protect eligible segments that are not suitable should any of the identified river segments be located within proposed special status species plant or wildlife ACECs. Federally listed and proposed species would be maintained and recovered by conserving and protecting their habitats on BLM-administered lands. The BLM would support habitat recovery on non-BLM-administered. This action would enhance and protect the fish ORVs.

Effects under Alternative C

Under Alternative C, eligible river segments would be determined suitable for NWSRS. Special status species management would further protect suitable segments in adjacent areas should segments be located within proposed special status species plant or wildlife ACECs.

Effects under Alternative D

Under Alternative D, impacts would be the same as those under Alternative C.

Effects under Alternative E

Under Alternative E, impacts would be the same as those under Alternative C.

WSRs: Effects from Visual Resources Management

Effects Common to All Alternatives

Under all alternatives, the East Fork Carson River Segment 1 would be managed as VRM Class I within 0.25-mile of either side of the ordinary high water mark. This would ensure viewsheds are maintained to VRM Class I objectives.

Effects under Alternative A

The BLM would manage 400 acres of the East Fork Carson River Segment 2 as VRM Class III. The objective would be to allow a moderate level of change in order to partially retain the existing character of the landscape. This would allow modifications that would directly impact the scenic ORVs.

The BLM would manage 600 acres of the East Fork Carson River Segment 3 as VRM Class II. This would allow for moderate level of change to viewsheds within the study corridor.

Effects under Alternative B

Under Alternative B, the three eligible segments along the East Fork Carson River would be determined to be not suitable for inclusion in the NWSRS and would be released from interim management protection. The East Fork Carson

River Segments 1, 2, and 3 would be managed similar to adjacent reaches of the river.

Effects under Alternative C

The BLM would manage 300 acres of the East Fork Carson River Segment 2 as VRM Class I and 100 acres as VRM Class II within 0.25-mile of either side of the ordinary high water mark. The acres within the VRM Class I would be provided direct protection to the scenic ORV and would have incidental protection to other ORVs. The VRM Class II objective would allow a low level of change. This would maintain the existing character of the landscape, while facilities and uses within WSR corridors would be managed to blend in with the surrounding landscape. Impacts on the scenic ORV from the areas in the VRM Class II would be greater than those in the VRM Class I areas.

Under Alternative C, 100 acres of the East Fork Carson River Segment 3 would be managed as VRM Class II and 500 acres would be managed as VRM Class I. These management directives would be developed to classify this segment as a Scenic Area. The areas classified as VRM Class II would allow for moderate amounts of development within the study corridor. This would offer more protection to the scenic ORV than the Recreation classification but less than the Wild classification. However, most acres would be managed under VRM Class I, which would provide direct protection to the scenic ORV and would have incidental protection to other ORVs.

Effects under Alternative D

Under Alternative D, impacts would be the same as those under Alternative C.

Effects under Alternative E

The BLM would manage 400 acres of the East Fork Carson River Segment 2 as VRM Class II. The VRM Class II objective would be to allow a low level of change. This would maintain the existing character of the landscape, while facilities and uses within WSR corridors would be managed to blend in with the surrounding landscape.

Impacts on the East Fork Carson River Segment 3 would be the same as those under Alternative A.

WSRs: Effects from Geology and Mineral Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Subject to WSR interim management guidance, BLM Manual 6400 (2012), the BLM would temporarily withdraw 400 acres in Segment 1, 400 acres in Segment 2, and 600 acres in Segment 3 from locatable minerals within a quarter mile of eligible segment banks subject to valid existing rights. Potential impacts from

locatable mineral development would not occur in these areas. Mineral leasing would continue subject to restrictions that would maintain ORVs. Salable minerals would be avoided or closed. The BLM would implement or require design features, mitigation measures, and monitoring systems to ensure the continued eligibility of the segments. All segments would need to be managed to protect the ORVs, free flowing nature, and tentative classification of each segment. Until the eligibility determination is superseded, management activities and authorized uses would not be allowed to adversely affect either eligibility or the tentative classification (43 CFR, Part 8351).

Effects under Alternative B

The three eligible segments along the East Fork Carson River would be determined to be not suitable for inclusion in the NWSRS and would be released from interim management protection. The East Fork Carson River Segment 1, 2, and 3 would be managed similar to adjacent reaches of the river. There would be no more direct protection to any ORVs except those in the 400 acres of Segment 1 within the Carson Iceberg WSA. All ORVs outside of Segment 1 could be impacted by mineral development. These impacts could include habitat degradation, erosion, runoff, and modifications to the landscape affecting scenic quality and settings for cultural and historical ORVs. Development of site-specific mitigation measures would reduce the potential for adverse impacts.

Effects under Alternative C

The East Fork Carson River Segment 1 would have an NSO stipulation for fluid minerals. A portion of Segment 1 (400 acres) is within the Carson Iceberg WSA and is closed to fluid minerals. This would generally provide the same level of protection as closing the entire area to leasing. This is because, while the mineral would still be available for extraction beneath the surface, facilities would be located outside of the study corridor. Segment 1 would also be closed to mineral material disposal and nonenergy mineral leasing. It would be recommended for withdrawal from locatable mineral entry, and any surface-disturbing activities would be prohibited. These stipulations and closures would protect all ORVs by limiting activities associated with mineral development that might cause habitat degradation, erosion, runoff, and modifications to the landscape, affecting scenic quality and settings for cultural and historical ORVs.

Effects under Alternative D

Impacts would be the same as those under Alternative C.

Effects under Alternative E

Impacts would be the same as those under Alternative C.

WSRs: Effects from Recreation and Visitor Services*Effects Common to All Alternatives*

Management of recreation and visitor services would protect WSR ORVs along Segments 2 and 3 of the East Fork Carson River as these segments are located within a SRMA. Managing these areas as a SRMA would protect the high quality recreational experience in this area. Since segment 2 has been identified as having ORVs for recreation, SRMA management would provide more protection for the overall recreational experience. Increased recreation could impact ORVs associated with each segment. Uses in riparian and wetland vegetation could degrade the riparian and wetland vegetation ORV. Recreation can also cause soil erosion and degrade water quality, potentially impacting fish and vegetation ORVs.

Effects under Alternative A

Under Alternative A, 400 acres of Segment 2 and 600 acres of Segment 3 would be within an SRMA. Recreation opportunities include camping, picnicking, hiking, hunting, fishing, white water rafting, sailing, mountain biking, nature study, rock collecting, sightseeing, and photography. Recreation management along this segment of the East Fork Carson River would also enhance its recreational ORVs.

Effects under Alternative B

The three eligible segments along the East Fork Carson River would be determined to be not suitable for inclusion in the NWSRS and would be released from interim management protection. The East Fork Carson River Segments 1, 2, and 3 would be managed similar to adjacent reaches of the river. Approximately 400 acres of Segment 2 and 600 acres of Segment 3 would be within an SRMA. ORVs would still have a limited amount of protection based on SRMA management. The ORVs in 400 acres of Segment 1 within the Carson Iceberg WSA would also be protected under WSA management.

Effects under Alternative C

Under Alternative C all three segments would be determined suitable for NWSRS. WSR segments and ORVs would be protected under NWSRS authorities. However, for those segments that are located within an SRMA, ORVs would be further protected outside of designated corridor boundaries.

Effects under Alternative D

Impacts would be the same as described under Alternative C.

Effects under Alternative E

Impacts would be the same as described under Alternative C.

WSRs: Effects from Comprehensive Travel and Transportation Management*Effects Common to All Alternatives*

Motorized and mechanized vehicle use could impact ORVs and tentative classification of WSR study segments. Closing areas to motorized or mechanized travel would indirectly protect areas from impacts associated with uses such as dispersed camping along river banks, firewood cutting and incompatible recreation activities. These impacts include vegetation trampling, disturbance of wildlife habitat, soil erosion and runoff, and noise. Closure of areas to motorized and mechanized travel would only provide indirect protection of all ORVs. Designating routes for certain motorized and mechanized uses would help protect ORVs to a lesser degree. Where routes remain open to motorized or mechanized travel, the use of the routes would still impact ORVs.

Effects under Alternative A

Segment 1 of the East Fork Carson River is within the Carson Iceberg WSA; therefore, OHV use would be limited to cherry-stemmed roads and primitive routes, except in emergency situations consistent with policy established in BLM Manual 6330. These limitations would help protect ORVs, but impacts would still occur due to motorized and mechanized uses.

Effects under Alternative B

WSRs in Segment 1 would overlap with WSA management in the Carson Iceberg and would have travel management areas with limitations or closures for motorized or mechanized use; however, the BLM would not manage the remaining WSRs with limitations or closures for motorized or mechanized use. Impacts on ORVs from OHV travel include; vegetation trampling, wildlife habitat disturbance, and soil erosion would be the greatest under this alternative due to the lack of restrictions on travel management.

Effects under Alternative C

The fewest impacts would occur to Segment 1 of any alternative due to WSAs being limited to cherry-stemmed roads and ways and primitive routes, for motorized and mechanized travel. Segments 2 and 3 would not be protected by an overlapping WSA. Impacts from travel management including construction of new roads and would be subject to site-specific analysis to determine if activities are compatible with suitable WSRs. Implementation of mitigation measures would reduce the potential for adverse impacts.

Effects under Alternative D

Impacts would be the same as described under Alternative C.

Effects under Alternative E

Impacts would be the same as described under Alternative C.

WSRs: Effects from Wild and Scenic Rivers*Effects Common to All Alternatives*

Under all alternatives a common goal is to protect NWSRS-eligible river segments, in accordance with the Wild and Scenic Rivers Act and BLM guidance (BLM Manual 6400). Where WSR study segments are determined eligible or suitable for inclusion in the NWSRS, the BLM would ensure that identified ORVs would not be diminished and the ORV, free-flowing nature or tentative classification of the segment is maintained. Continuing to manage segments as eligible (Alternative A) or a determination of suitability (Alternatives C, D, and E) would result in direct protection of the ORVs, free-flowing nature, and tentative classification of the segments. Where segments are determined not suitable for inclusion in the NWSRS, management of other resources could provide indirect protection to the free-flowing nature and ORVs identified. This would still be present even if the segment is not suitable and is released from further WSR study.

Effects under Alternative A

The East Fork Carson River Segment 1 would be managed to protect the ORVs, free-flowing nature, and tentative classification as Wild. Segment 2 would be managed to protect the ORVs, free-flowing nature, and tentative classification as Recreational. Segment 3 would be managed to protect the ORVs, free-flowing nature, and tentative classification as Scenic. These three segments of the East Fork of the Carson River are identified as eligible for inclusion in the NWSRS. The segments would be protected for their ORVs, free-flowing nature, and water quality under interim management until a determination of suitable is made.

Effects under Alternative B

All three segments along the East Fork Carson River would be determined not suitable for inclusion in the NWSRS and would be released from further study. The identified ORVs would potentially be impacted by multiple uses, as described in the effects of other resources in this section.

Effects under Alternative C

The BLM would determine the three river segments along the East Fork Carson River to be suitable for inclusion in the NWSRS. These segments would receive direct protection for the identified ORVs, free-flowing nature, and tentative classification based on use restrictions, implementation of mitigation measures, and ensuring uses are compatible with WSR management.

Effects under Alternative D

Impacts would be the same as those under Alternative C, except the tentative classification for Segment 3 would be Recreational and not Scenic. The difference in the tentative classification would have minimal impacts on Segment 3, but would allow river access facilities to be located near the river. The

Hangman's Bridge river access site along Segment 3 would be improved under Alternative D. Any facilities would have to be screened from view from the river, protect river values, and harmonize with the natural and cultural settings as close as possible (BLM 2012o).

Effects under Alternative E

Impacts would be the same as those under Alternative C.

WSR: Cumulative Effects

Past and Present Actions

Past and present actions in the cumulative impacts analysis area impacting WSR management include surface-disturbing activities such as minerals exploration and development, renewable energy, lands and realty development activities, and recreation. Impacts have also resulted from trampling and sedimentation associated with livestock grazing, wild horse and burros, and wildlife.

Reasonably Foreseeable Actions

There are no reasonably foreseeable future projects that would impact the segments. However, if major projects were proposed, and there were no systematic analysis of impacts on river-related values, in accordance with the WSR Act, there could be significant cumulative impacts on river-related values.

Climate change may also affect the fish and recreational ORVs by changing the flows through the segments that support the fish habitat and the water-related recreational activities that the segments support. To the extent that climate reduces the instream flow, either through evaporation or changes in precipitation, the ORVs could be impacted. Effects would be the same under all alternatives.

In addition, activities such as livestock grazing, wild horse and burro, and wildlife use are expected to continue and could have impacts on the segments.

Incremental Cumulative Impact – Combined Past, Present, Reasonably Foreseeable Future Actions – All Alternatives

Past actions and events contributing to cumulative effects within or next to rivers have resulted primarily from surface-disturbing activities and population growth. Use of natural resources within the planning area is expected to remain at current or slightly increased levels. As a result, surface-disturbing activities affecting rivers could continue. However, the BLM would maintain discretionary authority over most land uses and would permit only those actions that would not impair or conflict with river systems, reducing cumulative effects on these areas. As the population increases, activity and use within or next to rivers also increases. An increasing population could mean that housing would continue to be built closer to rivers, thereby affecting the quality of natural and cultural resources near rivers.

4.5.6 Wilderness Study Areas

Wilderness Study Areas (WSAs) are public lands that were found to have wilderness characteristics in accordance with Section 603 of FLMPA and the BLM's wilderness review process but have not been designated as wilderness by Congress. After initial and extensive surveys of public lands in Nevada in 1979 and 1980, 110 WSAs were designated in November of 1980. WSAs meet the minimum criteria for wilderness characteristics: size, naturalness, and an outstanding opportunity for solitude or primitive and unconfined recreation. During the inventory process any unique or supplemental values were noted.

There are nine WSAs that are completely or partially within the decision area: the Augusta Mountains, Burbank Canyons, Carson-Iceberg, Clan Alpine Mountains, Desatoya Mountains, Gabbs Valley Range, Job Peak, Slinkard, and the Stillwater Range. This chapter discusses the impacts from proposed management actions of other resources and resource uses on these WSAs. Existing conditions are described in **Section 3.4.5, Wilderness Study Areas**. The size of each of the nine WSAs is described in **Table 2-1, Comparative Summary of Alternatives**. BLM policy is to protect the wilderness characteristics of all WSAs in the same or better condition than they were on October 21, 1976 until Congress determines whether they should be designated as wilderness (BLM 2012e). Since the authority to establish or release WSAs lies solely with Congress, no new WSAs will be established under any alternative, nor will any WSA be released under any alternative.

Summary

Overall, impacts on WSAs are similar under all alternatives because the BLM policy for WSAs as detailed in Manual 6330 requires the management of wilderness characteristics in a nonimpairment manner. All alternatives have limitations and closures to surface-disturbing activities. Management actions differ between alternatives in the event a WSA were released from wilderness consideration by Congress.

Under Alternative B, if a WSA is released from wilderness consideration, management emphasis would be on multiple uses as a priority over protecting wilderness characteristics.

Alternative B would provide for the least amount of protection to wilderness characteristics compared to other alternatives. Under Alternatives C, D, and E, if a WSA is released, mitigation measures to retain outstanding opportunities for solitude or primitive and unconfined recreation would be developed. Under Alternative C, minerals and transportation and travel management decisions include more indirect protection of wilderness characteristics than Alternatives B, D, and E should the WSA be released.

Management for the following resources would not result in an effect on WSAs: air quality, climate, soil and water, vegetation, fish and wildlife, special status species, wild horses and burros, wildfire ecology, cultural resources,

paleontological resources, caves and cave resources, forestry and woodland products, livestock grazing, renewable energy, Back Country Byways, national trails, back country wildlife conservation areas, tribal interests, public health and safety, and interpretation and environmental education.

Methods of Analysis

Methods and Assumptions

The following methods and assumptions were used to assess the impacts on WSAs:

- The nine WSAs in the planning area will continue to be managed according to BLM Manual 6330, Management of Wilderness Study Areas (BLM 2012e), until Congress either designates or releases all or portions of the WSAs from further consideration.
- Managing the WSAs according to BLM policy will protect their wilderness characteristics in a manner that will not “impair the suitability of WSAs for preservation as wilderness” (FLPMA Section 603[c]). This is the “nonimpairment standard.”
- Management of the WSAs is subject to valid existing rights and grandfathered uses under all alternatives, consistent with BLM policy.
- Grazing in the WSAs is permitted at the levels that were authorized in 1976, and changes to grazing practices would have to meet the nonimpairment standard. Maintenance of range improvements (e.g., troughs and corrals) that existed in 1976 is permissible but any new improvement will need to meet the nonimpairment standard.
- Grazing management practices may not be changed solely because they are impacting wilderness characteristics.
- Impacts on the WSAs from implementing management actions for other resources, resource uses, and special designations would be considered negligible since any action will be required to meet the nonimpairment standard to be authorized.
- Motorized and mechanized travel within the WSA will only be allowed on primitive routes identified at the time of the WSA designation.
- If Congress releases a WSA from wilderness consideration, the area will be inventoried for wilderness characteristics and a determination made if wilderness characteristics exist at that time.

Indicators

The following indicators were used to assess the degree of impacts on WSAs:

- Changes in the inventoried wilderness characteristics (naturally appearing, opportunities for solitude or primitive and unconfined recreation, and unique or supplemental values) within the WSAs
- Changes in apparent naturalness resulting from management actions or vegetation manipulations that made the area appear less natural
- Impacts on opportunities for solitude or primitive and unconfined recreation—as measured by the amount and type of visitor use
- Severity of disturbances or changes in unique and supplemental values or cultural resources; status of indigenous species that are listed, or are candidates for listing, as threatened or endangered

Nature and Type of Effects

In the WSAs, impacts normally come from recreational use, vegetation treatments, wildfires, and the installation, maintenance, and use of range/wildlife improvements allowed under BLM policy. There could be indirect impacts from management of other resources that would protect wilderness characteristics in the WSAs, such as overlapping acres of WSAs with WSRs or areas of critical environmental concern.

Managing the WSAs to protect their wilderness characteristics would protect wilderness values through application of the minimum tool requirement and analysis for all surface-disturbing activities to ensure actions would not impair the WSAs' wilderness characteristics.

BLM policy states that mining and mineral leasing uses can continue in the manner and to the degree that they were being conducted at the time the FLPMA was passed, as long as they do not cause unnecessary or undue degradation of the lands. While this clause allows for a natural progression of development, new impacts cannot be of a significantly different type than the impacts involved with the pre-FLPMA activity.

Grazing activities and related range improvements in WSAs may continue in the same manner and degree as on the date the FLPMA was enacted (October 21, 1976), even though the activity may impair wilderness suitability (BLM 2012e). Structures, such as fences, stock trails, springs, and stock ponds, in the WSA would continue to be maintained even though continued maintenance and presence of structures can impact the areas apparent naturalness.

Fire is managed in WSAs to allow the frequency and intensity of the natural fire regime to play its inherent role in the ecosystem. This means both allowing fire where ecosystems evolved in the presence of fire and preventing unnatural spread of fire in ecosystems that evolved without broad-scale fires. Wildfire suppression would prevent catastrophic destruction of vegetation and would preserve wilderness characteristics in these areas over the long term. Fire suppression restrictions, such as on the use of heavy equipment or retardant,

could limit the effectiveness of suppression actions. However, resource damage from suppression equipment would be reduced. Minimum impact suppression tactics would minimize unanticipated effects on wilderness characteristics during fire suppression.

Some WSAs overlap or are next to stream segments eligible for or suitable for inclusion in the NWSRS or other special management areas, such as ACECs or SRMAs. Management of these other areas could also indirectly protect wilderness characteristics of the WSAs due to their protective measures. This is because they often include complementary management objectives.

Below is a comparison of the effects from each resource on WSAs under Alternatives A, B, C, D, and E.

WSAs: Effects from Visual Resources Management

Effects Common to All Alternatives

While the nine WSAs in the decision area are recognized, they will be managed as VRM Class I, in accordance with BLM policy. This means that any changes to the characteristic landscape would be very low and would not attract attention. The effect of the VRM Class I objective on WSAs helps retain their naturalness.

Effects from Visual Resource Management if WSA is released from Wilderness Consideration by Congress

Effects under Alternative A

Areas released from wilderness consideration would be assigned a new VRM classification based upon the visual resource inventory and management objectives for the area.

Effects under Alternative B

Under Alternative B, the Burbank Canyons, Carson Iceberg, Desatoya Mountains, Gabbs Valley Range, Job Peak, Slinkard, and the Stillwater Range areas would be managed under the VRM Class II objectives. The Clan Alpine area would be managed under the VRM Class III objective. VRM Class II designation would allow for greater retention of the existing landscape character with minimal changes while the VRM Class III designation for the Clan Alpine would allow for a greater change in landscape character and a higher range of disturbance from resource use or related activities. The retention of existing scenic values would be greater than Alternative A since VRM objectives for all areas except the Clan Alpine area would be at least a Class II designation.

Effects under Alternative C

Under Alternative C, effects would be similar to those described under Alternative B, except the Carson Iceberg area would be managed under VRM Class I objectives rather than Class II, and the Clan Alpine area would be managed under VRM Class II objectives rather than Class III. In addition,

management actions relating to mineral leasing, mineral disposal, and range management in these areas would be to emphasize the protection of wilderness characteristics over other resource uses, which will also provide a higher level of protection for visual resources. This alternative would provide greater protection of scenic values over Alternative B since the management actions for the Carson Iceberg, Clan Alpine, and Desatoya areas would be also provide additional protection of scenic values.

Effects under Alternative D

Effects on visual resources under Alternative D would be similar to those described under Alternative B. This would emphasize the protection of wilderness characteristics over other resource uses, which would provide greater protection of the scenic values in the area. All other areas previously designated as WSAs would be managed for the highest resource value or use, which would allow greater changes to the landscape and the scenic values of the area.

Effects under Alternative E

Under Alternative E, effects would be similar to those described under Alternative B, except the Carson Iceberg area would be managed under VRM Class I objectives rather than Class II, and the Clan Alpine area would be managed under Class II objectives rather than Class III. In addition, management actions relating to mineral leasing, mineral disposal, and range management, would be to emphasize the protection of wilderness characteristics over other resource uses which will also provide a level of protection for visual resources. In addition, the portion of the Job Peak area that falls within the Fox Peak Cultural ACEC would be managed under the management plan for the ACEC, which will afford additional protection of scenic values of this area. This Alternative would provide greater protection of scenic values than Alternative B since the management actions for the Carson Iceberg, Clan Alpine, Desatoya, and Job Peak areas would also provide additional protection of scenic values.

WSAs: Effects from Geology and Mineral Management

Effects Common to All Alternatives

Under all alternatives, the BLM would continue to maintain WSAs as closed to mineral material disposal, fluid mineral leasing, and nonenergy solid mineral leasing. The continuation of these closures would protect the apparent naturalness and overall wilderness characteristics of the WSAs. However, any valid existing right or grandfathered use on the date of approval of the FLPMA (October 21, 1976), would be recognized. Examples of valid existing rights are a mineral lease or a valid mining claim (BLM 2012e). If released by Congress, most alternatives allow for these areas to retain their outstanding opportunities for solitude or primitive and unconfined recreation by developing mitigation measures and managing certain areas for specific characteristics.

Effects under Alternative A

Impacts would be the same as the *Effects Common to All Alternatives*.

Effects under Alternative B

Impacts would be the same as the *Effects Common to All Alternatives* until a WSA is released by Congress. If released, these areas would be managed as adjacent BLM-administered lands not currently under WSA designation with an emphasis on resource development. The degree of impact would depend on the type and intensity of development, but any surface-disturbing activities are expected to lower the apparent naturalness and any outstanding opportunities for solitude and primitive and unconfined recreation. This alternative would allow for greater mineral development than Alternative A.

Effects under Alternative C

Impacts would be the same as those described under *Effects Common to All Alternatives*. This alternative would provide the greatest protection to WSAs from mineral development due to these areas being closed to nonenergy mineral leasing, mineral material disposal, and fluid mineral leasing and being recommended for withdrawal from locatable mineral entry. Also, the BLM would develop mitigation measures to retain outstanding opportunities for solitude or primitive and unconfined recreation.

Effects under Alternative D

Impacts would be the same as the *Effects Common to All Alternatives* except this area would be managed with a VRM Class II designation, which would further restrict mineral development and close the area to fluid mineral leasing. This alternative would have similar effects as described under Alternative B.

Effects under Alternative E

Impacts would be the same as those described under *Effects Common to All Alternatives*. VRM designation in the Carson Iceberg area would be managed as VRM Class I, which would not allow any surface disturbance such as mineral development and the Clan Alpine, Desatoya, and Job Peak areas would be managed as VRM Class II, which would restrict mineral development activities. These areas would also be closed to fluid mineral leasing. The Job Peak area that falls within the potential Fox Peak ACEC would also be recommended for withdrawal from locatable mineral entry. This alternative would allow for mineral development but would be more restrictive than Alternative B.

WSAs: Effects from Comprehensive Travel and Transportation Management

Effects Common to All Alternatives

Although varying to a different degree between alternatives, the closures and limited use on primitive routes and trails in the WSAs would protect the wilderness characteristics. This is accomplished by restricting activities that

could impact natural appearance and opportunities for solitude and primitive/unconfined recreation.

Motorized travel is limited to primitive routes that were documented during the inventory process and identified at the time the WSAs were designated unless subsequent planning decisions provided additional limitations or closures.

Primitive routes within WSAs are not maintained in any way for general access. The only provision is where a permittee is allowed to repair a specific site to allow for continued access to an authorized facility. Any use is generally limited to a non-impairing level.

Routes appearing to be within the WSA were cherry-stemmed out and are technically outside of the WSA.

No new trails or related structures will be allowed within the WSA unless they meet the nonimpairment standard.

Should a WSA be released from consideration by Congress, travel restrictions will revert to designations based on other existing management decisions for the area or will be designated during the travel planning process.

Effects under Alternative A

Travel within WSAs is currently limited to primitive routes and trails. There is the potential for impacts on wilderness characteristics from motorized travel on primitive routes that could impact natural appearance and opportunities for solitude and primitive/unconfined recreation for visitors recreating without motorized travel. Under Alternative A, the closed to motorized travel designation for the Burbank Canyons Scenic Area will remain in effect over the same area in the event that the WSA is released from wilderness consideration.

Effects under Alternative B

Motorized and mechanical travel would be limited to primitive routes identified at the time the WSA was designated. No new trails would be permitted unless they meet the nonimpairment standard. Effects on travel management would be similar to those described under Alternative A, except motorized and mechanized travel in the Burbank Canyons area would be managed as limited to designated routes if the WSA is released from wilderness considerations.

Effects under Alternative C

WSAs would be closed to motorized and mechanized use (administrative motorized use would be permitted). Closing WSAs to motorized and mechanized use would protect the wilderness characteristics by restricting activities that could impact natural appearance and opportunities for solitude and primitive/unconfined recreation. If the Carson Iceberg WSA and the portion of the Job Peak WSA within the potential Fox Peak ACEC are released from wilderness consideration, the areas would remain closed to motorized travel.

Effects under Alternative D

Effects from Comprehensive Travel and Transportation Management on WSAs under Alternative D are the same as the effects under Alternative B.

Effects under Alternative E

Effects from Comprehensive Travel and Transportation Management on WSAs under Alternative E are the same as the effects under Alternative B.

WSAs: Effects from Lands and Realty

Effects Common to All Alternatives

Under all alternatives, new authorizations must meet the nonimpairment criteria. Most new land use authorizations would qualify as new disturbance and would not be authorized. There would be no surface disturbance, permanent new development, or ROWs allowed in WSAs that do not meet the nonimpairment standards. The absence of any surface disturbances would enhance and protect the apparent naturalness of WSAs.

BLM-administered lands within WSAs may not be disposed of with the exception of mining patents and certain land exchanges.

Existing ROWs may continue to be renewed if they are still being used for their authorized purpose.

Effects under Alternative A

Impacts would be the same as those under *Effects Common to All Alternatives*.

Effects under Alternative B

Impacts would be the same as those under *Effects Common to All Alternatives*.

Effects under Alternative C

If the WSAs were released from wilderness consideration by Congress, the following WSAs would be managed as ROW exclusion areas: Carson Iceberg, Clan Alpine, and the Desatoya Mountains. The absence of ROWs and other land use authorizations would help preserve the apparent naturalness of these areas and would allow for outstanding opportunities of solitude.

Effects under Alternative D

If the WSAs were released from wilderness consideration by Congress, the Carson Iceberg WSA would be managed as a ROW avoidance area. If ROWs were located on these lands, there would be impacts on the size of the area, naturalness, and primitive and unconfined recreation. Depending on the extent of the ROWs, wilderness characteristics could be eliminated.

Effects under Alternative E

Impacts from Alternative E are the same as effects under Alternative D, except a portion of Fox Peak Cultural ACEC, which includes area overlapping with Job

Peak WSA (43,300 acres) would be managed as a ROW exclusion area. This would help preserve the apparent naturalness of these areas on Job Peak and would allow for outstanding opportunities of solitude.

WSAs: Effects from Wild and Scenic Rivers

Effects Common to All Alternatives

Management of the East Fork Carson River Segment I, which overlaps the Carson Iceberg WSA, could also indirectly protect wilderness characteristics of the WSA due to the protective measures. Management of the eligible or suitable East Fork Carson River Segment I would be complementary to management of the WSA.

Effects under Alternative A

There are 410 eligible acres within the Carson Iceberg WSA. Managing the segment to maintain the free-flowing nature, wild classification, and ORVs would complement the wilderness characteristics, especially naturalness.

Effects under Alternative B

No acres would be determined to be suitable for inclusion in the NWSRS, so there would be no WSRs that overlap or impact WSAs.

Effects under Alternatives C, D, and E

There would be 410 acres within the Carson Iceberg WSA that are suitable for inclusion in the NWSRS. Managing the segment to maintain the free-flowing nature, wild classification, and ORVs would complement the wilderness characteristics, especially naturalness. The East Fork Carson River Segment I would also be managed, in many ways, according to interim management policy for WSAs (e.g., VRM Class I, ROW exclusion area, closed to mineral material disposal and nonenergy mineral leasing, and no surface-disturbing activities). This would maintain the wilderness characteristics of the WSA in the area of overlap should the WSA be released from further consideration as Wilderness.

WSAs: Effects from Areas of Critical Environmental Concern

Effects Common to All Alternatives

Where the WSA or is next to ACECs, ACEC management could indirectly protect wilderness characteristics due to the protective measures proposed for the ACECs, which are complementary to management objectives for WSAs. In the event that the WSA is released by Congress from wilderness consideration, ACEC management would continue to offer some indirect protection of wilderness characteristics should the ACEC overlap the WSA boundary that has been released.

Any management decisions made for an ACEC would remain in effect should the WSA be released from wilderness consideration.

Effects under Alternative A

There are currently no ACECs that overlap WSAs, so there are no impacts from ACECs on WSAs under Alternative A. Impacts would be similar to those described under *Effects Common to All Alternatives*.

Effects under Alternative B

A total of 55,400 acres of the Fox Peak Cultural, Namazii Wunu Cultural, and Tagim aša Cultural ACECs overlap WSAs. The impacts would be the same as those described under *Effects Common to All Alternatives*.

Effects under Alternative C

A total of 91,700 acres of the Clan Alpine Greater Sage-Grouse, Desatoya Greater Sage-Grouse, Fox Peak Cultural, Namazii Wunu Cultural, Pine Nut Bi-State Sage Grouse, and Tagim aša Cultural ACECs overlap WSAs. The impacts would be the same as those under *Effects Common to All Alternatives*.

Effects under Alternative D

A total of 45,100 acres of the Fox Peak Cultural and Tagim aša Cultural ACECs overlap WSAs. The impacts would be the same as those under *Effects Common to All Alternatives*.

Effects under Alternative E

A total of 43,300 acres of the Fox Peak Cultural ACEC overlaps the Job Peak WSA. The impacts would be the same as those under *Effects Common to All Alternatives*.

WSAs: Effects from Wilderness Study Areas

Effects Common to All Alternatives

Under all alternatives, no surface disturbance, permanent new development, or ROWs are allowed in WSAs if they do not meet the nonimpairment criteria. These restrictions would preserve the apparent naturalness, outstanding opportunities for solitude and primitive and unconfined recreation, and any supplemental values within the WSAs.

If Congress releases a WSA from wilderness consideration, the area would be inventoried for wilderness characteristics and a determination made if wilderness characteristics exist at that time.

All WSAs would be managed according to VRM Class I objectives.

Effects under Alternative A

There would be no impacts because there are no specific actions that are likely to affect WSAs. The WSAs would continue to be managed in accordance with BLM Manual 6330.

Effects under Alternative B

There would be no impacts because there are no specific actions that are likely to affect WSAs. The WSAs would continue to be managed in accordance with BLM Manual 6330. If released, the areas currently being managed as WSAs would be managed for their highest resource values. However, it is possible that the lands would be available for motorized and mechanized travel on designated routes. This action would impact the solitude and natural characteristics in these areas.

Effects under Alternative C

Impacts on WSAs would be the similar as those described under Alternative B, except that all WSAs would be closed to motorized and mechanized travel. If Congress releases a WSA from wilderness consideration, wilderness characteristics would be preserved for the long term in certain areas because Alternative C would protect visual characteristics: the Carson Iceberg, Clan Alpine, and the Desatoya Mountains. Mitigation measures would be developed in these areas to retain outstanding opportunities for solitude or primitive and unconfined recreation. Also, motorized SRPs would not be authorized in the aforementioned areas. The Carson Iceberg would also be closed to motorized travel, except for administrative purposes, which would preserve the apparent naturalness, solitude, and opportunities for primitive recreation.

Effects under Alternative D

Impacts on WSAs would be the same as those under Alternative B, unless the WSA were released by Congress from wilderness consideration. If released, wilderness characteristics would be preserved for the long term in certain areas such as the Carson Iceberg, due to visual and other characteristics in this area. Mitigation measures would be developed in this area to retain outstanding opportunities for solitude or primitive and unconfined recreation.

Effects under Alternative E

Impacts on WSAs would be the same as those under Alternative B, unless the WSA were released by Congress from wilderness consideration. If released, wilderness characteristics would be preserved for the long term in certain areas because Alternative E would protect visual and other characteristics. The only area included for this protection if released from wilderness consideration is the Carson Iceberg. Mitigation measures would be developed in this area to retain outstanding opportunities for solitude or primitive and unconfined recreation. Also, a portion of Job Peak (43,300 acres) that overlaps with the Fox Peak Cultural ACEC would be managed as part of the ACEC; this could offer some indirect protection of wilderness characteristics if Job Peak were released from wilderness consideration.

WSAs: Cumulative Effects*Past and Present Actions*

Few discernible impacts have occurred on WSAs based on past, present, and reasonably foreseeable future actions relating to livestock and wild horse and burro grazing, except in areas of concentrated grazing impacting, water sources, wilderness characteristics, and visitor experiences. These impacts have been reduced based on managing to achieve land health standards and through permit requirements. Minerals, renewable energy development, and ROW use restrictions would result in limited or prohibited development within WSAs, subject to valid existing rights.

Reasonably Foreseeable Actions

There are no reasonably foreseeable future projects that would impact the WSAs. However, impacts on recreational OHV use would remain at current levels based on travel management limitations to existing roads and trails. Areas where grazing closures occur may improve the wilderness experiences for some users.

Incremental Cumulative Impact – Combined Past, Present, Reasonably Foreseeable Future Actions – All Alternatives

Incremental effects would be limited to recreation, with improved visitor experiences for those seeking solitude or wilderness experiences. Impacts on recreational motorized OHV use would remain at current levels based on travel management limitations to existing roads and trails. There would be no additional impacts from other resources and uses defined under past, present and reasonably foreseeable actions.

4.6 SOCIAL AND ECONOMIC FEATURES

This section describes the impacts on social and economic features of the planning area and includes the following subsections:

- Tribal interests
- Public health and safety
- Interpretation and environmental education
- Facilities and transportation management

4.6.1 Tribal Interests

This section presents potential effects from management actions on Native American traditional cultural properties (TCPs), traditional cultural uses, and tribal economic interests in the planning area. The CCD administers public lands within the aboriginal territory of people identified based on commonality and differences in language and culture as Washoe, Northern Paiute, and Western Shoshone. Six tribal governments have reservations within the planning area,

and four additional tribes have reservation lands beyond the planning area boundary. These ten tribes are all recognized by the federal government.

Summary

As described in **Section 3.5.1**, the planning area contains a number of TCPs and natural, medicinal, and sacred resources and places valuable to the cultural heritages of the tribes within the planning area. Traditional cultural properties are rooted in the community's history and are important in maintaining cultural identity.

The boundaries of these resources and impact areas are often difficult to assess. Resources tied to particular locations and that meet the criteria for eligibility can be listed on the NRHP. Some TCPs have values that do not have a direct property referent and may not manifest themselves by distinguishable physical remains but still are subject to consideration in planning. It is the continuity of their significance and importance to the maintenance of contemporary traditions that is important.

While many TCPs are well known, some locations or resources may be privileged information that is restricted to specific practitioners or clans. For tribes, maintaining confidentiality and customs regarding traditional knowledge may take precedence over identifying and evaluating these resources, resulting in information being unavailable for inclusion in the NEPA analysis.

Proposed management actions that could impact or increase the risk of impacts on TCPs and traditional cultural uses are as follows:

- Actions that expose traditional resources to intense fire
- Actions that affect the visual, atmospheric, or aural setting of TCPs and sacred sites
- Actions that affect access to TCPs or use areas and actions and actions that affect the economic development potential of reservation lands

Overall socioeconomic effects from management actions are discussed in **Section 4.6.4**, Social and Economic Conditions and Environmental Justice; effects on tribal economic interests on reservation lands are likely similar to those of other residents in rural low-income parts of the planning area.

Under all alternatives, the BLM would continue to manage the sensitive tribal information collected through consultation. This information would facilitate the avoidance or mitigation of impacts resulting from future projects, including visual effects on sacred sites and TCPs. In addition, because planned actions would be subject to review as federal undertakings under the Section 106 process, there would be requirements for tribal consultation and consideration and mitigation of impacts on tribal interests for site-specific actions.

Tribal consultation would be completed to address anticipated impacts resulting from authorized and planned activities; even so, unauthorized or unplanned activities such as wildland fire, recreation events, unauthorized collection, and vandalism could lead to impacts on tribal resources.

Overall, Alternative C, with its emphasis on resource conservation and protection, would best protect TCPs and sacred sites and uses.

There would be no impacts on tribal interests based on proposed management of the following resources: WSAs, BCWCAs, Back Country Byways, public health and safety, and facilities and transportation management.

Methods of Analysis

Methods and Assumptions

Tribal interests considered in this analysis are TCPs and sacred sites, culturally important natural resources, traditional uses and practices, tribal access, and economic rights established by treaty and economic considerations of tribes and tribal reservations within the planning area. Traditional uses and practices in the planning area include gathering and harvesting plants, pinyon pine nuts, medicines, and other materials; hunting; and ceremonial and religious practices.

This section evaluates the management actions in Chapter 2 and provides a qualitative analysis of how these actions could affect the tribal interests described above.

The following assumptions were considered in the analysis:

- TCPs are places associated with the cultural practices or beliefs of a living community. These sites are rooted in the community's history and are important in maintaining cultural identity. Contemporary Native American groups maintain social and cultural ties to the land and resources of the CCD. There may be areas of importance to contemporary Native Americans that are not readily identifiable outside of those communities and that may only be revealed through consultation.
- Management actions that protect natural and cultural resource values would also protect traditional Native American religious values, use areas, sacred sites, and ancestral ceremonial locations.
- Measures that withdraw land or restrict access or surface development to protect natural or cultural resources can provide direct and indirect protection of TCPs and sacred sites from disturbance, incompatible activities, and unauthorized activities.
- Intrusions to the visual, atmospheric, or aural setting can extend a considerable distance from the location of the resource.

- Population growth, urban encroachment, and development on adjacent lands would increase the risk of impacts on TCPs and traditional uses through recreation, visitation, vandalism, and changes in setting.
- The BLM, as a federal agency, would continue to maintain government-to-government relationships with federally recognized tribes. Consultation would continue with Native American groups to identify any TCPs or resource uses and to address impacts. Through this process, effects would be minimized or eliminated, although residual effects would be possible.
- Native Americans or other traditional communities may have concerns about federal impacts on cultural resources, religious practices, or natural resource gathering that may occur because of federal actions. In cases where these concerns might be present, consultation would occur with the potentially affected group or groups.
- There are no assets in the planning area that are formally held in trust for tribes by BLM.
- Management actions that close areas to mineral operations and ROWs or propose surface disturbance restrictions would protect the integrity of Native American traditional use areas, sacred sites, and ceremonial locations.
- Closing areas to motorized travel would protect the integrity of Native American use areas, sacred sites, and ceremonial locations from physical damages caused by motorized vehicles and reduce access to sensitive areas.
- Variance acres for utility scale solar energy would impact Native American use areas, depending on the number of acres delineated.
- Tribal interests and traditional cultural resources are identified primarily through consultations with Indian tribes recognized by the federal government on a government-to-government basis (Executive Order 13084 and Executive Memorandum of April 29, 1994, on Government-to-Government Relations with Native American Tribal Governments).

Indicators

The use of indicators in NEPA analyses should provide information on determining the extent or degree to which a tribal interest, resource, or setting is damaged, its physical integrity is lost, or it is otherwise adversely affected by a proposed action. However, unlike cultural resources, which have legal criteria for determining the impacts, the impacts on areas or resources of tribal interest and the severity of impacts depends on the perspective and context of the tribe

or affected group. In other words, significant impacts would be determined by Indian people defining what is culturally or spiritually important to them.

The following indicators were used to assess the degree of impacts on tribal interests:

- The extent to which the action affects TCPs
- The extent to which the action affects traditional cultural uses
- The extent to which the action affects reservation economic development

Nature and Type of Effects

The nature and type of most effects on tribal interests are general and unquantifiable. In general, activities that create new development or surface-disturbing uses in areas considered sensitive to a tribe could decrease opportunities for tribes to maintain traditional cultural practices. These include granting ROWs for road and highway construction, mineral and energy development, vegetation treatments, motorized use, and livestock grazing. In addition, natural processes that are impossible to control likely add to the human-caused impacts listed above, including climate change, drought, and lightning-caused fires. The general impacts on tribal interests that could result through the implementation of each alternative analyzed in this EIS are described below.

Tribal Interests: Effects from Air Quality Management

Effects Common to All Alternatives

Airborne particulates and emissions can impact the visual and atmospheric setting of TCPs and sacred sites in areas where these resources are present. All of the alternatives include general provisions to reduce and control airborne particulates and emissions. Ensuring compliance with federal, state, and local air quality laws, regulations, and standards would ensure air quality is maintained on reservations. Effects of all of the alternatives on tribal resources would be similar.

Tribal Interests: Effects from Climate Management

Effects Common to All Alternatives

Potential changes in local ecosystems associated with effects of climate change may alter the availability of plants, wildlife, or other natural resources for traditional uses. Using adaptive management, such as restoration of natural systems, construction of infrastructure, and water conservation, to address climate change would reduce climate change-induced risks, such as flooding and invasive and exotic species. It would also reduce the potential for wildfire spread and would maintain the integrity of traditional use areas, sacred sites, and ceremonial locations.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Tribal Interests: Effects from Soil Resources

Effects Common to All Alternatives

Maintaining and improving vegetation cover and improving soil structure would reduce soil loss due to wind and water erosion. Implementing BMPs and mitigation measures would reduce soil erosion potential and maintain soil stability. Applying CSU and NSO fluid lease stipulations would also reduce soil erosion potential. Areas important to Native American traditional uses, sacred sites and areas, ceremonial locations, and archaeological sites would be protected from soil erosion.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Tribal Interests: Effects from Water Resources

Effects Common to All Alternatives

Maintaining satisfactory watershed conditions and water quality would maintain streams, creeks and areas important to Native Americans within priority watersheds. Management actions that protect, maintain, and improve existing water quality and quantity of springs would serve to protect sacred sites and

ceremonial locations used by Native Americans. Implementation of SOPs, BMPs, and mitigation measures would also protect surface and groundwater resources that are important to Native Americans.

Effects under Alternative A

Impacts would be similar to those described under *Effects Common to All Alternatives*. Identifying and giving special consideration to watersheds during activity plan development would prevent accelerated soil loss, watershed degradation, flood and sediment damage, and important wildlife habitat destruction, which would also maintain areas important for Native American uses.

Effects under Alternative B

Identifying priority watersheds and waters supply areas would give special consideration to these areas. Impacts would be similar to those identified under Alternative A.

Effects under Alternative C

Alternative C would implement use restrictions to protect priority watersheds. Native American uses and values would be protected from disturbances related to salable and solid mineral leasing, ROWs, and by NSO stipulations applicable to fluid minerals.

Effects under Alternative D

Impacts would be similar to those described under Alternative C; however, surface disturbance would be considered on a case-by-case basis, as determined by a set of management criteria. Native American uses and values would have a lower degree of protection compared to Alternative C.

Effects under Alternative E

Impacts would be similar to those described for Alternative D.

Tribal Interests: Effects from Vegetation Resources

Effects Common to All Alternatives

Managing for healthy, diverse, and productive vegetation communities would maintain the integrity of Native American use areas and traditional cultural sites. Preventing the introduction or the spread of invasive and noxious plants would minimize impacts in the long run; however, vegetation treatments to eliminate some species may adversely affect a Native American traditional resource. An emphasis on collaboration with federal, state, tribal, county governments and other conservation groups for restoration and weed control would be beneficial and would ensure input from tribal governments.

Effects under Alternative A

Impacts would be similar to those described under *Effects Common to All Alternatives*.

Effects under Alternative B

Revegetation of disturbed areas would focus on using plant species that have a high degree of success, including nonnative plant species. Native plants important to Native Americans for medicinal and religious use may not be considered in revegetating areas, limiting the availability of these plants. Alternative B would allow removal of sagebrush when there is a resource or resource use of higher priority. Fewer restrictions would be applied for the removal of sagebrush under this alternative.

Access to and availability of sagebrush could be restricted and could affect Native American religious and ceremonial uses. Alternative B would convert 20,000 acres of low-density pinyon-juniper areas into restored sagebrush habitat per year for the first decade of the RMP or until approximately 200,000 acres have been restored. More sagebrush would be available for ceremonial use.

Effects under Alternative C

Only native plants would be used to seed areas and would include species important to Native Americans. Alternative C would manage large intact sagebrush communities by limiting ground disturbance. The availability of sagebrush and undisturbed lands would be greater compared to Alternative B and would better provide for Native American uses and values. Alternative C would remove 3,500 acres annually of low-density pinyon-juniper, resulting in fewer acres converted into sagebrush as compared to Alternative B.

Effects under Alternative D

Alternative D allows native and nonnative plant species to be considered for revegetation if used to provide site stability and ecological function. Plants important to Native Americans would not necessarily be seeded. Management of sagebrush would be emphasized by creating future stands of sagebrush within urban interface areas. Depending on the location of tribal lands to urban interface areas, more sagebrush would be available for Native American use over time. Alternative D would develop sagebrush restoration strategies. The amount of sagebrush restored would depend on the size of proposed planning areas.

Effects under Alternative E

Alternative E would be similar to Alternative D, except that this alternative would favor native species to provide site stability and ecological function. The potential for reestablishment of plants that are important to Native Americans would be higher. Management of sagebrush would include creation of future stands, while allowing a selective removal of sagebrush on a case-by-case basis. The availability of sagebrush for Native American ceremonial use would slowly increase over time under this alternative.

Impacts would vary based on the location and size of areas where sagebrush is removed. Alternative E would remove 8,500 acres annually of low-density pinyon-juniper in order to expand sagebrush areas. The potential sagebrush

restoration areas would be smaller compared to Alternative A and larger than Alternative C.

Tribal Interests: Effects from Fish and Wildlife Management

Effects Common to All Alternatives

Management objectives and actions that would improve wildlife habitat are important to Native American cultures and values. Management of ACECs to protect important wildlife habitat would also protect areas containing important Native American religious values. Protecting sage-grouse habitat would be important in protecting Native American traditional use areas.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Tribal Interests: Effects from Special Status Species Management

Effects Common to All Alternatives

Impacts would be similar to those described under wildlife management. Protecting and improving special status species habitat by implementing use restrictions, protective buffers, and management of special designation areas would also protect traditional use areas important to Native Americans.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Tribal Interests: Effects from Wild Horse and Burro Management

Effects Common to All Alternatives

Managing HMAs where habitat conditions (forage, water, cover, space) are adequate to support healthy populations of wild horses and burros would also maintain healthy Native American traditional use areas.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Tribal Interests: Effects from Wildland Fire Ecology and Management

Effects Common to All Alternatives

Protecting values at risk from catastrophic impacts of wildfire would also protect important Native American traditional use areas. Implementing fuel treatments would reduce the potential for catastrophic fire spread and would protect areas containing important natural and cultural resource values. ESR projects would reestablish hydrologic function and biologic integrity of areas in the long term, which would also help restore Native American traditional use areas where fire has occurred.

Effects under Alternative A

Impacts would be similar to those described under *Effects Common to All Alternatives*.

Effects under Alternative B

Alternative B would prioritize hazardous fuels reduction projects to protect infrastructure and improvements. Protecting areas containing important Native American values would have lower priority.

Effects under Alternative C

Alternative C would prioritize hazardous fuels projects to protect sensitive biological, cultural, and other natural resources. Protecting areas containing cultural values and corresponding Native American use values would be prioritized, affording a higher degree of protection to areas important to Native Americans. This alternative would also prioritize expansion of healthy vegetation ecosystems, which would further improve areas important to Native Americans.

Effects under Alternative D

Alternative D would prioritize hazardous fuels reduction projects to protect fire-safe communities. Protection of areas important to Native Americans would not be prioritized.

Effects under Alternative E

Alternative E would prioritize hazardous fuels reduction projects to protect sensitive biological, cultural, and other natural resources from wildfire. Fuel treatments would be used to create fire-safe communities and improve vegetation communities, wildlife habitats, and watershed and riparian areas. Areas important to Native Americans would have a lower degree of protection and would not expand healthy vegetation to the degree proposed under Alternative C.

Tribal Interests: Effects from Cultural Resources Management*Effects Common to All Alternatives*

Compliance with the Section 106 process would help protect and ensure the sustainability of traditional use areas. Implementing the Native American Graves Protection and Repatriation Act would include consultation with appropriate tribes to address Native American human remains that have been excavated or when inadvertent discovery has occurred. Closing areas known to contain human burials to surface disturbance would protect burials and would protect important ancestral ties and values associated with burials.

Accommodating access and ceremonial use of identified Native American sacred sites and mitigating surface disturbance impacts and visual intrusions would ensure the physical integrity of these sacred sites are maintained.

Effects under Alternative A

Impacts would be the same as described under *Effects Common to All Alternatives*. Alternative A would manage one ACEC for the protection of cultural resource and associated Native American traditional use areas.

Effects under Alternative B

Alternative B would protect historic roads and trails that are NRHP eligible but not congressionally designated by implementing a 0.25-mile ROW avoidance buffer and by implementing mitigation measures on eligible or unevaluated trail

segments and associated sites. Traditional Native American use areas associated with historic roads or trails would also be protected.

Alternative B would protect within 0.125 mile of rock art sites by prohibiting surface-disturbing activities and visual intrusions if they adversely affect values, in accordance with the NRHP evaluation. These protective measures would also protect the integrity of rock art sites. Alternative B proposes managing eight ACECs for the purpose of protecting cultural resources. More traditional use areas would be protected as compared to Alternative A.

Effects under Alternative C

Alternative C would protect historic roads and trails that are NRHP eligible but not congressionally designated by implementing a 2.5-mile ROW avoidance buffer and by implementing mitigation measures on eligible or unevaluated trail segments and associated sites. Traditional Native American use areas associated with historic roads or trails would also be protected to a greater extent than under Alternative B.

Alternative C would protect within 1.0 mile of rock art sites by prohibiting surface-disturbing activities and visual intrusions if they adversely affect values in accordance with the NRHP evaluation. These protective measures would also protect the integrity of rock art sites to a greater extent, compared to Alternatives B and E. Alternative C proposed nine ACECs that would protect cultural resources. More traditional use areas associated with cultural resources would be protected compared to Alternative B.

Effects under Alternative D

Impacts would be the same as Alternative B. Alternative D proposes six ACECs that would protect cultural resources and associated traditional use areas. Fewer areas would be protected compared to Alternatives B and C.

Effects under Alternative E

Alternative E would protect historic roads and trails that are NRHP eligible but not congressionally designated by implementing a 1.0-mile ROW avoidance buffer and by implementing mitigation measures as eligible or unevaluated trail segments and associated sites. Traditional Native American use areas associated with historic roads or trails would be protected, but to a lesser extent than Alternative C.

Alternative E would protect within 0.5 mile of rock art sites by prohibiting surface-disturbing activities and visual intrusions if they would adversely affect values, in accordance with the NRHP evaluation. These protective measures would protect the integrity of rock art sites to a lesser extent than Alternative C. Alternative E proposes three ACECs that would protect cultural resources and associated traditional use areas. With the exception of Alternative A, this alternative proposes the fewest number of ACECs to protect cultural resources and traditional use values.

Tribal Interests: Effects from Paleontological Resources Management

Effects Common to All Alternatives

Proposing ACECs to protect paleontological resources would have an indirect effect of protecting traditional use areas that overlap with ACEC boundaries.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Tribal Interests: Effects from Visual Resources Management

Effects Common to All Alternatives

Management of VRM class objectives would provide protection of visual values and the scenic quality of existing landscapes and would help maintain the integrity of traditional Native American use areas. Higher levels of protection for visual resources would occur for areas managed as VRM class objectives I and II, and less protection would occur under objectives III and IV.

Effects under Alternative A

Alternative A would manage 564,100 acres under VRM Class I and 38,300 acres under VRM Class II. The integrity of traditional Native American use areas would be maintained in these areas.

Effects under Alternative B

Alternative B would manage 564,100 acres under VRM Class I and 56,800 acres under VRM Class II. The integrity of traditional Native American use areas would be maintained in these areas to a greater extent than Alternative A.

Effects under Alternative C

Alternative C would manage 981,900 acres under VRM Class I and 733,900 acres under VRM Class II. The integrity of traditional Native American use areas would be maintained to the greatest extent in these areas, compared to all other alternatives.

Effects under Alternative D

Alternative D would manage 564,100 acres under VRM Class I and 66,400 acres under VRM Class II. The integrity of traditional Native American use areas would be maintained in a manner similar to Alternative B.

Effects under Alternative E

Alternative E would manage 564,100 acres under VRM Class I and 513,600 acres under VRM Class II. The integrity of traditional Native American use areas would be maintained. This alternative provides the potential for the highest degree of protection of all alternatives except Alternative C.

Tribal Interests: Effects from Caves and Cave Resources Management

Effects Common to All Alternatives

Designating caves and cave resources having cultural significance and issuing closure orders for caves and cave resources having cultural resources would protect Native American traditional use areas, ceremonial locations, and sacred areas. Providing special management attention to protect significant cave resources would also protect traditional Native American uses.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Tribal Interests: Effects from Forestry and Woodland Management

Effects Common to All Alternatives

Traditional Native American pinyon-nut gathering would be allowed, subject to limitations on the number of pounds harvested and commercial harvesting restrictions.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Tribal Interests: Effects from Livestock Grazing Management

Effects Common to All Alternatives

Managing grazing to achieve standards for rangeland health and completion of the Section 106 process would protect cultural resources and Native American traditional use areas from livestock grazing.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Tribal Interests: Effects from Geology and Mineral Management

Effects Common to All Alternatives

Mineral exploration and development would impact the integrity of Native American traditional use areas. Impacts would depend on the size, nature, and location of mineral exploration and development. Rehabilitating lands disturbed by mineral operations would serve to restore the integrity of Native American traditional use areas. Closing areas to locatable minerals would protect traditional use areas and petroglyphs important to Native Americans.

Effects under Alternative A

Alternative A recommends withdrawing an additional 3,700 acres to locatable mineral entry (in addition to the existing withdrawals on 194,900 acres). Withdrawal of these areas would maintain the integrity of traditional use areas and would protect landscape features and sacred sites that are important to Native Americans. Alternative A includes 839,100 acres that are closed to fluid

minerals leasing. Closure of these areas would maintain the integrity of traditional use areas.

Fluid minerals management would also apply NSO and seasonal restrictions, which would also maintain the integrity of traditional use areas. Salable minerals management would maintain the closure of 564,200 acres, maintaining the integrity of Native American traditional use areas within the closed footprint. Nonenergy leasing would be closed on 738,800 acres. The integrity of Native American use areas would be maintained within the closed footprint.

Effects under Alternative B

Alternative B recommends withdrawal of an additional 439,600 acres to locatable mineral entry. This would maintain the integrity of traditional use areas and would protect landscape features and sacred sites that are important to Native Americans much more than Alternative A. Alternative B would close 768,500 acres to fluid minerals. Impacts would be similar to those described under Alternative A; however, fewer acres would be protected. Fluid minerals management would also apply 404,600 acres with NSO stipulations. These restrictions would maintain the integrity of traditional use areas to a greater extent than Alternative A.

Alternative B management includes CSU stipulations applicable to fluid minerals on 2,120,200 acres. The integrity of traditional use areas within the CSU footprint would be maintained. Salable minerals actions would close 807,200 acres, maintaining the integrity of Native American traditional use areas within the closed footprint, with impacts similar to those described under Alternative A. Nonenergy leasing would close 981,900 acres. The integrity of Native American use areas would be maintained within the closed footprint, the same as Alternative A.

Effects under Alternative C

Alternative C recommends withdrawal of an additional 117,500 acres to locatable mineral entry. Withdrawal of these areas would maintain the integrity of traditional use areas and protect landscape features and sacred sites that are important to Native Americans and to a much greater extent than under Alternative A. Alternative C would close 2,081,700 acres to fluid minerals leasing, which would afford the greatest protection to Native American uses from fluid minerals leasing. Fluid minerals management would apply 1,039,200 acres with NSO stipulations. These restrictions would also maintain the integrity of traditional use areas to the greatest extent, compared to the other alternatives.

Alternative C management would also apply CSU stipulations on 1,242,800 acres. The integrity of traditional use areas within the CSU footprint would be maintained. Salable minerals management would close 3,004,800 acres, maintaining Native American traditional use areas within the closed footprint. This alternative would afford more protection to the integrity of Native

American traditional use areas compared to Alternative A. Nonenergy leasing would be closed on 2,960,800 acres. The integrity of Native American use areas would be maintained within the closed footprint. This alternative affords the greatest protection to traditional use areas.

Effects under Alternative D

Alternative D recommends withdrawing an additional 440,800 acres to locatable mineral entry. Withdrawal of these areas would maintain the integrity of traditional use areas and would protect landscape features and sacred sites that are important to Native Americans, protecting more acres than Alternative A. Alternative D would close 737,000 acres to fluid minerals leasing.

This alternative affords the fewest acres protecting Native American traditional use areas. Fluid minerals would also apply 864,800 acres with NSO stipulations. These restrictions would maintain the integrity of traditional use areas to a greater extent than Alternative A. Alternative D management includes CSU stipulations applicable to fluid minerals on 2,071,400 acres. The integrity of traditional use areas within the CSU footprint would be maintained. Salable minerals would close 807,700 acres, maintaining the integrity of Native American traditional use areas within the closed footprint. Impacts would be the same as under Alternatives A and B. Nonenergy leasing would be closed on 738,800 acres. The integrity of Native American use areas would be maintained within the closed footprint, similar to Alternative B.

Effects under Alternative E

Alternative E recommends withdrawing an additional 470,600 acres to locatable mineral entry. Withdrawal of these areas would provide the more potential to maintain traditional use areas and to protect landscape features and sacred sites that are important to Native Americans, compared to Alternative A. Alternative E would close 1,007,200 acres to fluid minerals leasing, providing greater protection of Native American use areas than Alternative A.

Fluid minerals management would also apply 1,151,600 acres of NSO stipulations. These restrictions would maintain the integrity of traditional use areas to a greater extent than Alternative A. Alternative E management includes CSU stipulations applicable to fluid minerals on 1,844,900 acres. The integrity of traditional use areas within the CSU footprint would be maintained. Salable minerals would close 1,778,700 acres, maintaining the integrity of Native American traditional use areas within the closed footprint. Protection of traditional use areas would be greater than under Alternative A. Nonenergy leasing would be closed on 1,785,900 acres. The integrity of Native American use areas would be maintained within the closed footprint and would provide a greater level of protection than Alternative A.

Tribal Interests: Effects from Recreation and Visitor Services*Effects Common to All Alternatives*

Delineating SRMAs would allow for the intensive management of recreational and OHV activities in areas of existing use that may currently be impacting the integrity of traditional Native American use areas. Delineating ERMAs would allow for management at a less intense level since the recreational use is less. Both designations would provide for a higher level of management actions that would protect traditional uses and sites compared to areas without designations. Designation of RMAs is expected to increase recreation-related tourism which would benefit tribal communities and businesses.

Effects under Alternative A

Two existing SRMAs, totaling 67,700 acres, would continue to be managed at current levels, and no ERMAs are designated. No additional RMAs would be designated and recreation would be managed primarily through the SRP program. Dispersed recreational uses, including motorized travel, OHV activity, and nonmotorized uses would be addressed through SRPs or through ancillary management actions established for other resources. This alternative would provide the least protection to the integrity of traditional Native American uses since management actions and areas designated for motorized recreation use would be minimal and the least restrictive. Alternative A would manage two areas as SRMAs, totaling 67,700 acres.

Effects under Alternative B

Four new SRMAs would be designated and managed in addition to the two existing SRMAs, for a total of 76,100 acres. Eight ERMAs consisting of 1,678,520 acres would be designated and managed in addition to the six SRMAs. This alternative would emphasize recreation-based economic development and activities that would benefit local tribal communities and businesses through tourism and spending. Management of the RMAs would allow for greater protection of Native American traditional use areas and sites by regulating both organized and dispersed motorized and nonmotorized recreation throughout most of the planning area.

Recreation requiring stipulations to reduce impacts on other resources in and outside of RMAs would be managed through the SRP program. Alternative B would provide a high level of management, and management actions would provide for the greatest amount of economic development. Regulations and stipulations for protection of natural or cultural resources would more than Alternative A.

Effects under Alternative C

The two existing SRMA boundaries would be modified and one additional SRMA would be designated, for a total of 74,700 acres. Fifteen ERMAs would be designated, for a total of 1.52 million acres. The management of 18 RMAs would

increase protection of Native American values and sites since the second highest number of acres of all the alternatives would be under intensive or moderate level of regulation.

Management actions within the RMAs would be the most restrictive to protect natural resources and cultural values. Recreation requiring stipulations to reduce impacts on other resources or resource uses in and outside of RMAs would be managed through the SRP program, as under the other alternatives. The increased number of ERMAs would allow for more intense and specific tourism marketing, which would benefit local tribal communities and businesses through increased visitation and spending. This alternative would provide a high level of protection, while maintaining a high level of economic activity.

Effects under Alternative D

Four SRMAs would be designated and managed, for a total of 67,100 acres in addition to the fewest number of ERMAs (six) that would be designated, consisting of 292,620 acres. Emphasis in the ten RMAs would be on recreation occurring near or next to the urban interface. This alternative would provide for increased protection of Native American values and resources near urban areas but would not address recreation occurring in rural or dispersed areas to the extent of Alternatives B, C, and D. The economic benefits to rural or tribal communities and business would be less than expected under Alternative A.

Effects under Alternative E

Six SRMAs, totaling 106,100 acres, and fifteen ERMAs, totaling 2.08 million acres, would be designated and managed for recreational activities. This alternative would emphasize recreation-based economic development and activities that would benefit local tribal communities and businesses through tourism and spending, similar to Alternative B. Management of the RMAs would allow for greater protection of Native American traditional use areas and sites by regulating both organized and dispersed motorized and nonmotorized recreation throughout most of the planning area. Recreation requiring stipulations to reduce impacts on other resources in and outside of RMAs would be managed through the SRP program, as with other alternatives. Alternative E would provide for the highest level of management, while management actions would provide for the greatest amount of economic development. Regulations and stipulations for protection of natural or cultural resources would be the greatest of the alternatives.

Tribal Interests: Effects from Comprehensive Travel and Transportation Management

Effects Common to All Alternatives

Comprehensive Travel and Transportation Management planning will protect Native American values by providing management decisions to restrict access to sensitive areas identified as needing to be closed to motorized travel, while

maintaining access needs to cultural sites and sacred areas required by tribal members.

Travel management decisions on open/closed/limited areas will be made in the RMP, while routes will primarily be designated during the travel management planning process. Future route designations to open/close/limit routes to motorized travel in culturally sensitive areas can be made or modified in the future through the travel management plan as needs are identified.

Effects under Alternative A

Under Alternative A, 3,840,300 acres currently designated as open to cross-country travel would remain the same, 37,198 acres would remain closed, and 924,300 acres would be designated as limited to existing routes or seasonal use. This alternative would have the greatest impact on Native American values, uses, and sites. This is because motorize travel would have the least management restrictions of any of the alternatives, and cross-country travel is not restricted to RMAs. This alternative would provide a high potential for economic benefits to tribal communities and business due to the limited restrictions on travel management.

Effects under Alternative B

A total of 95,300 acres would be designated as open to cross-country travel primarily in SRMAs and playas; 34,700 acres of sensitive or hazard areas would be designated as closed, and close to 4.68 million acres would be designated as limited to existing routes. Native American values, uses, and sites would receive considerably more protection from motorized travel and decreased access than under Alternative A. Economic benefits may be reduced compared to Alternative A due to the increased restrictions for motorized travel and OHV use.

Effects under Alternative C

Under Alternative C, 1,300 acres would be designated as open to motorized travel, nearly 1.79 million acres would be designated as closed, and 3.01 million acres would be designated as limited to existing routes. This alternative would provide the greatest protection of Native American values, uses, or sites since it has the highest amount of closure of any of the alternatives. Areas with intensive OHV use would be eliminated, and access to sensitive areas off of designated routes would not be permitted. This alternative may have the greatest impacts on economic benefits due to the restrictive travel designations.

Effects under Alternative D

Alternative D would designate 22,700 acres as open to motorized travel, would close 32,200 acres, and would leave nearly 4.75 million acres limited to existing routes. Effects of this alternative would be similar to Alternatives B and E.

Effects under Alternative E

Alternative E proposes designating 55,700 acres as open to motorized travel in SRMAs and playas; 30,300 acres would be closed, and nearly 4.72 million acres would be limited to existing routes within the planning area. This alternative would provide the best mix of managing motorized travel within the planning area to protect cultural resources and sites, while still providing for economic benefits from spending generated through tourism and OHV use.

Tribal Interests: Effects from Lands and Realty*Effects Common to All Alternatives*

Land tenure adjustments could affect the setting of lands containing important Native American values if moved from public to private ownership. Acquiring lands to protect sensitive cultural resource values would also enhance the integrity of Native American use areas. Right-of-way avoidance and exclusion areas would protect Native American traditional use areas, sacred sites, and other religious values, as surface disturbance would be restricted or not allowed.

Effects under Alternative A

Alternative A proposes 564,100 acres as ROW exclusion areas. Traditional Native American use areas and sacred sites would be protected within these areas.

Effects under Alternative B

Acquiring lands based on the principle of no net gain for public lands would not provide opportunities to protect cultural resources or enhance Native American use areas. Alternative B proposes 580,000 acres as ROW exclusion areas. Traditional Native American use areas and sacred sites would be protected within exclusion areas. Impacts would be similar to those proposed under Alternative A. Alternative B proposes 1,195,800 acres as ROW avoidance areas. Fewer protections related to Native American uses would occur in avoidance areas compared to exclusion areas.

Effects under Alternative C

Acquiring lands or land rights that enhance resource values and provide for conservation easements, preservation of corridors, habitat for wildlife, and cultural resources would also protect and enhance Native American use areas. Alternative C proposes 2,675,800 acres of ROW exclusion areas. Traditional Native American use areas and sacred sites would be protected within exclusion areas, with substantially larger acreage compared to Alternatives A and B. Alternative C proposes 369,300 acres as ROW avoidance areas. Fewer protections related to Native American uses would occur compared to exclusion areas.

Effects under Alternative D

Alternative D would acquire lands or land rights for the following purposes:

- Enhance resource values
- Provide for conservation easements, preservation of corridors or habitat for wildlife, or protection of cultural resources
- Provide public access for recreation use or other uses
- Consolidate lands for more effective management

Protection of Native American use areas would be greater than under Alternatives A and B but less than under Alternative C. Alternative D proposes 564,100 acres as ROW exclusion areas. Traditional Native American use areas and sacred sites would be protected within exclusion areas. Impacts would be the same as described under Alternative A. Alternative D proposes 1,226,100 acres as ROW avoidance areas. Fewer protections for Native American uses would occur compared to exclusion areas. Under this alternative, approximately 32,900 acres would be eligible for transfer to the Bureau of Indian Affairs, based on congressional approval. This would provide additional opportunities for economic development.

Effects under Alternative E

Acquisitions to enhance resource values would be the same as Alternative D. Alternative E proposes 605,900 acres as ROW exclusion areas. Traditional Native American use areas and sacred sites would be protected within exclusion areas. More areas would be protected compared to Alternatives A, B, and D. Alternative E proposes 1,448,200 acres as ROW avoidance areas. Fewer protections relating to Native American uses would occur compared to exclusion areas. Under this alternative, approximately 30,700 acres would be eligible for transfer to the Bureau of Indian Affairs, based on congressional approval. This would provide additional opportunities for economic development.

Tribal Interests: Effects from Renewable Energy

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A proposes 905,900 acres as utility-scale solar development areas. Impacts affecting the integrity of Native American traditional uses, sacred sites, and values would occur should solar development proceed. Impacts would depend on the size, nature, and location of such development.

Effects under Alternative B

Alternative B proposes 773,400 acres as utility-scale solar development areas. Impacts on Native American traditional uses would be similar to those described under Alternative A. Alternative B also proposed 1,220,200 acres as ROW avoidance areas for wind energy development. Impacts on the integrity of

Native American use areas would be mitigated by avoiding sensitive areas or by applying grant stipulations.

Effects under Alternative C

Alternative C proposes 578,400 acres as utility-scale solar development areas. Impacts on Native American traditional uses would be lower than those described under Alternatives A and B, as fewer acres would be available for solar energy development. Alternative C also proposes 2,073,200 acres as ROW exclusion areas for wind energy development. Impacts on the integrity of Native American use areas would be mitigated by avoiding sensitive areas or by applying grant stipulations. Fewer impacts on traditional use areas would occur compared to Alternative B.

Effects under Alternative D

Alternative D proposes 672,100 acres as utility-scale solar development areas. Impacts on Native American traditional uses would be lower than under Alternatives A and B but higher than under Alternative C. Alternative D also proposes 1,228,100 acres as ROW avoidance areas. Impacts on the integrity of Native American use areas would be mitigated by avoiding sensitive areas or by applying grant stipulations. Impacts would be similar to Alternative B.

Effects under Alternative E

Alternative E would manage 629,900 acres as utility-scale solar development areas. Impacts on Native American traditional uses would be lower than Alternatives A, B, and D. Alternative E would also manage 956,900 acres as ROW avoidance areas and 629,900 acres as ROW exclusion areas. Impacts on the integrity of Native American use areas would be mitigated by avoiding sensitive areas or by applying grant stipulations. Fewer impacts on traditional uses would occur compared to Alternatives A, B, and D.

Tribal Interests: Effects from Areas of Critical Environmental Concern

Effects Common to All Alternatives

Managing areas as ACECs where special management attention is required to protect and prevent irreparable damage to important resources would protect the integrity of traditional Native American use areas and sacred sites. These resources are biological, historic, cultural, or scenic values, fish and wildlife, and other natural systems or processes. The degree of protection would vary based on the number of ACECs and acres proposed for management under each alternative. The Pah Rah High Basin Petroglyph ACEC would be managed as an ACEC under all of the alternatives.

Effects under Alternative A

Under Alternative A, six ACECs would continue to be managed, totaling 21,800 acres.

Effects under Alternative B

Under Alternative B, four ACECs would continue to be managed and nine would be proposed for designation, totaling 371,170 acres. The Black Mountain/Pistone Archaeological District ACEC, the Fox Peak Cultural ACEC, the Greater Sand Mountain ACEC, the Grimes Point Archaeological District ACEC, the Namazi Wunu Cultural ACEC, and the Tagim aša Cultural ACEC would be designated under this alternative providing more protection for traditional Native American use areas and sacred sites than under Alternative A.

Effects under Alternative C

Alternative C would continue to manage five ACECs and would propose the designation of an additional 18, totaling 786,270 acres. The Black Mountain/Pistone Archaeological District ACEC, the Fox Peak Cultural ACEC, the Greater Sand Mountain ACEC, the Grimes Point Archaeological District ACEC, the Namazi Wunu Cultural ACEC, and the Tagim aša Cultural ACEC would be designated under this alternative, providing more protection for traditional Native American use areas and sacred sites than under Alternative A.

Effects under Alternative D

Alternative D would continue to manage three ACECs and would propose the designation of an additional eight, totaling 180,000 acres. The Black Mountain/Pistone Archaeological District ACEC, the Fox Peak Cultural ACEC, and the Grimes Point Archaeological District ACEC would be designated under this alternative, providing more protection for traditional Native American use areas and sacred sites than under Alternative A.

Effects under Alternative E

Alternative E would continue to manage four ACECs and would propose the designation of an additional four, for a total of 82,770 acres. The Fox Peak Cultural ACEC and the Grimes Point Archaeological District ACEC would be designated under this alternative, providing more protection for traditional Native American use areas and sacred sites than under Alternative A.

Tribal Interests: Effects from Interpretation and Environmental Education*Effects Common to All Alternatives*

Engaging the public through education and increased awareness and understanding of public land would protect and ensure the integrity of traditional Native American use areas and help protect sacred sites.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Tribal Interests: Cumulative Effects

Past, present, and reasonably foreseeable future actions and conditions within the cumulative effects analysis area have affected and will likely continue to affect tribal interests. These are transmission lines, transportation/travel planning and development projects, vegetation treatments (including noxious weed and fuels treatments), geophysical projects, energy development projects (including oil and gas field development and infrastructure projects), and grazing allotment improvements (including fenceline construction and water developments).

All of the impacts described above in this tribal interest effects section would continue to occur into the future across all alternatives. With the trends of increasing mineral and energy development, transmission lines, and travel management planning and projects, there would be increased pressure on tribal resources, treaty and trust assets, and sacred sites. Impacts would be spread across the landscape; tribal interests, assets, resources, and sites located in areas outside of sage-grouse habitat would also be affected. The range of laws that require federal agencies to protect and preserve tribal trust assets, treaty rights, sacred sites, and other resources on lands under federal agency jurisdiction would provide some mitigation to the impacts; however, actions occurring on nonfederal lands (whether private or state jurisdiction) would have fewer protections, resulting in increased magnitude and severity of impacts in these areas.

As stated previously for federal undertakings, consultation would continue with Native American groups to identify any TCPs or resource uses and to address impacts. Through this process, effects would be minimized or eliminated, although residual effects would still be possible.

4.6.2 Public Health and Safety

The impact analysis affecting public health and safety management takes into consideration the direct, indirect, and cumulative effects of proposed objectives and management actions by resource or land uses as proposed under each alternative. The impact analysis includes impacts that may be both beneficial and adverse.

Based on review of all proposed alternatives, the following resources or uses do not have impacts on public health and safety.

- Paleontological
- Visual resource management
- ACECs
- Livestock grazing
- National Trails
- Back Country Byways
- WSRs
- BCWCAs
- Back Country Byways
- WSAs
- Tribal interests

Summary

Management of BLM-administered lands would take into account public safety to varying degrees under all alternatives. Public safety objectives and management strategies would protect people from natural or human-caused hazards on BLM-administered lands. Management to improve access or provide improvements such as public recreation facilities would also increase the use of BLM-administered lands and the need for public safety. Public safety hazards include abandoned mines, hot springs, hazardous materials, unexploded ordinance and explosives, and safety risks resulting from user conflicts.

Maintaining and improving roads would help mitigate the potential for unsafe road conditions. The Nevada BLM, in conjunction with the State of Nevada, initiated the Abandoned Mine Lands Program to remediate physical safety hazards from abandoned mines. This program includes placing warning signs and fencing and closing areas containing unsafe mine adits, shafts, and tunnels as well as backfilling unsafe mine openings or installing bat-compatible closure devices.

This section describes the direct, indirect, and cumulative impacts associated with public health and safety management.

Methods of Analysis*Methods and Assumptions*

- The population of the western United States will continue to increase, which will likely increase the demand to use BLM-administered lands for recreation.
- Closing areas or applying surface use restrictions to mineral exploration and development will reduce access and the potential for exposure from hazards affecting public health and safety.

- Establishing RMAs and developing management plans for recreation will reduce the potential for conflict between recreation groups.
- A travel management designation of “open” to unrestricted motorized travel will improve access and increase the potential to expose more people to public hazards.
- A travel management designation of “closed” will eliminate motorized access and decrease potential exposure to hazardous conditions.
- SRMAs may increase visitation and concentrate recreational use, but will also allow for intensive management and thereby reduce the potential for user conflicts in popular and high use areas. SRMAs that provide sanitation facilities will maintain public health.
- Issuance of special recreation permits will reduce the potential for user conflicts during permitted activities.
- Special designations or delineation of areas will increase public awareness or use of areas, but they will also increase management and protection of special resources.
- Providing public education and interpretive opportunities will influence public visitation and reduce the potential for associated public health and safety risks.
- There will be stable or increased frequency for bombing ranges in the planning area by the Department of Defense.

Public Health and Safety: Effects from Air Quality Management

Effects Common to All Alternatives

Maintaining air quality through compliance with various federal, state, and local laws and regulations would ensure cleaner air and reduce the potential for air quality issues that would affect public health. Implementing BMPs and mitigation measures to implementation level projects would also minimize degradation of air quality and thus minimize health risks to the public.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Public Health and Safety: Effects from Climate Management

Effects Common to All Alternatives

Implementing water management strategies associated with climate change to reduce flood risks would protect the public from severe precipitation and runoff.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Public Health and Safety: Effects from Soil Resources

Effects Common to All Alternatives

Management of soils and road maintenance to reduce the potential for wind or water erosion of soils would improve public safety. Roads would be less vulnerable to erosion, allowing for more safe travel areas. Reducing wind erosion would lessen the potential for airborne fugitive dust, which may impair travelers' vision along roadways, trails, and highways. Requiring BLM-administered land users to develop erosion control plans, based on erosion potential and slope percentages, would include designs to reduce erosion and improve public safety.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Public Health and Safety: Effects from Water Resources

Effects Common to All Alternatives

Management strategies to protect municipal water supplies within source water protection zones would help ensure safe drinking water for communities.

Effects under Alternative A and B

There would be no impacts to public health and safety from management of water resources under Alternatives A or B.

Effects under Alternative C

Alternative C would prohibit surface-disturbing activities within source water protection zones. Development of facilities within these zones would be prohibited. Any potential impacts on water quality from development or operations would not occur in these areas. This alternative provides for the highest level of protection of drinking water supplies.

Effects under Alternative D

Alternative D provides for development within source water protection zones if development is compatible with maintaining water quality. Compared to Alternative C, this alternative would provide a lower level of protection of safe drinking water to the public. This is because some uses would be allowed within source water protection zones, which could affect the quality of the waters by introducing toxins or pollutants.

Effects under Alternative E

Impacts would be similar to Alternative D.

Public Health and Safety: Effects from Vegetation Resources

Effects Common to All Alternatives

Fuel reduction projects would help reduce the potential for fire ignition, spread, and intensity and would provide for a higher level of protection and public safety from wildfire.

Effects under Alternative A

Same as those described under common to all alternatives.

Effects under Alternative B

Under Alternative B, 20,000 acres of low-density pinyon-juniper would be treated per year to achieve restoration of 200,000 acres of sagebrush-dominated communities. Alternative B also proposes to annually remove 8,500 acres of low-density pinyon-juniper areas and annually thin 6,500 acres of medium and high-density pinyon-juniper lands. Fuel treatments would reduce

fire intensity and spread, which would improve public safety. Having the highest number of acres to be treated would provide the highest level of public safety from wildfire, compared to other alternatives.

Effects under Alternative C

Alternative C would annually remove 3,500 acres of low-density pinyon pine and thin 1,500 acres of medium- to high-density pinyon pine. Fuel loadings would be higher compared to Alternative B. Fuel breaks would also reduce the potential for fire spread and provide for public safety but at much lower levels compared to Alternative B.

Effects under Alternative D

Management of fuels under Alternative D would focus on scenic, recreation, and wildlife habitat values and around communities. Managing fuels around communities would improve public safety based on the type of fuels treated and the number of acres treated.

Effects under Alternative E

Under Alternative E, 8,500 acres of low-density pinyon-juniper areas would be removed per year and 6,500 acres of medium- and high-density pinyon-juniper areas would be thinned. A greater level of public safety would be provided compared to Alternative C, as more acres would be treated.

Public Health and Safety: Effects from Fish and Wildlife

Effects Common to All Alternatives

Impacts would be similar to vegetation forestry and the wildland fire and ecology management sections. Proposed fuel treatments to reduce fuels would reduce the potential for catastrophic fire and would also provide for public safety. Habitat improvement projects would also serve to reduce fuels and indirectly provide for public safety by reducing the potential for wildland fire spread.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Public Health and Safety: Effects from Special Status Species Management

Impacts would be the same as described under *Effects from Fish and Wildlife*.

Public Health and Safety: Effects from Wild Horse and Burro Management

Effects Common to All Alternatives

Public access restrictions during wild horse and burro gathers would provide for public safety and protection from potential injuries from wild horse and burros, vehicles, and aircraft traffic. Management of wild horses and burros under all alternatives would also reduce risk of vehicle impacts.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Public Health and Safety: Effects from Wildland Fire Ecology and Management

Effects Common to All Alternatives

Wildland fire management under all alternatives would affect public safety by reducing the likelihood that the public would be injured from wildfire. Fuel treatments would reduce the potential for fire ignition and spread. Access restrictions during fire suppression would protect the public. ESR treatments would emphasize public safety. Treatments, such as removing burned or dead trees would reduce public safety hazards. Issuing fire restrictions would also reduce the potential for human-caused fire and would provide public safety benefits.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effect under Alternative D

Under this alternative, there would be greater emphasis on fire management and fuels treatments in the urban interface, which would promote public safety in or next to congested areas.

Effects under Alternative E

Alternative E would result in no unique impacts.

Public Health and Safety: Effects from Cultural Resources Management

Effects Common to All Alternatives

Cultural resource management to include the protection of historic mine areas or structures may affect the safety of visitors to these areas. Installing interpretive warning signs, fencing, and barriers from unsafe building and mine shafts would promote public safety.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Public Health and Safety: Effects from Caves and Cave Resources Management

Effects Common to All Alternatives

Use restrictions to protect unique cave formations, bats, and cultural resources would reduce cave visitation and the potential for the public to be injured while accessing caves. Installing gates or security fencing would also protect the public. Installing safety and warning signs would further serve to protect the public by informing them of potential hazards and avoidance areas.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Public Health and Safety: Effects from Forestry and Woodland Product Management

Impacts would be the same as described under *Effects from Vegetation Management*.

Public Health and Safety: Effects from Geology and Mineral Management

Effects Common to All Alternatives

Restricting public access during mineral exploration and development would protect the public from unsafe areas and operating mining equipment. Securing hazardous mining conditions would reduce hazards to the public and improve public safety. Reclamation activities that include reclaiming abandoned mine sites would also reduce hazards to the public.

Effects under Alternative A

Alternative A would maintain withdrawal of 194,900 acres of federal mineral estate from locatable mineral entry. It would also replace pre-FLPMA Classification and Multiple Use Act segregations with FLPMA withdrawals. This would result in withdrawing 3,700 acres of currently segregated lands from locatable mineral entry. Management of fluid minerals would close 839,100 acres and apply NSO stipulations to 700 acres; no areas would be subject to CSU stipulations. Salable minerals management would close 564,200 acres, and nonenergy leasable minerals would close 738,800 acres. This alternative closes the fewest acres and the fewest surface restrictions, resulting in the potential for more mineral operations. Compared to other alternatives, Alternative A has the potential for more public safety hazards from minerals development.

Effects under Alternative B

Compared to Alternative A, Alternative B would propose to withdraw 439,600 acres to locatable minerals. Management of fluid minerals would close 768,500 acres, apply NSO stipulations to 404,600 acres, and subject 2,120,200 acres to CSU stipulations. Salable minerals management would close 807,200 acres, and nonenergy leasable minerals would close 981,900 acres. This alternative reduces the number of acres closed to fluid minerals but increases the number of NSO acres applicable to fluids. Nonenergy leasing would close the same number of

acres as Alternative A. Alternative B would provide for a higher degree of public safety compared to Alternative A, as more areas would be closed or have restrictions on mineral development.

Effects under Alternative C

Alternative C recommends an additional 117,500 acres be withdrawn to locatable minerals. Management of fluid minerals would close 2,081,700 acres, would apply NSO stipulations to 1,039,200 acres, and would subject 1,242,800 acres to CSU stipulations. Salable minerals management would close 3,004,800 acres, and nonenergy leasable minerals would close 2,960,800 acres. This alternative affords the greatest number of acres as closed and the most acres with surface restrictions. This would restrict the potential for mineral operations and would provide for a higher degree of public safety.

Effects under Alternative D

Alternative D recommends an additional 440,800 acres be withdrawn to locatable minerals. Management of fluid minerals would close 737,000 acres, would apply NSO stipulations to 864,800 acres, and would subject 2,071,400 acres to CSU stipulations. Salable minerals management would close 807,700 acres, and nonenergy leasable minerals would close 981,900 acres. Impacts on public safety would be similar to Alternative A, with the exception that a greater number of acres with CSU stipulations would provide a higher level of public safety.

Effects under Alternative E

Alternative E recommends withdrawal of an additional 470,600 acres to locatable minerals. Management of fluid minerals would close 1,007,200 acres, would apply NSO stipulations to 1,151,600 acres, and would subject 1,844,900 acres to CSU stipulations. Salable minerals management would close 1,778,700 acres, and nonenergy leasable minerals would close 1,785,900 acres. This alternative affords a higher level of public safety from locatable minerals and a higher level of public safety from leasable minerals than the other alternatives, except Alternative C.

Public Health and Safety: Effects from Recreation and Visitor Services

Effects Common to All Alternatives

Delineating SRMAs and ERMAs would increase public safety of areas by reducing the potential for conflict between recreation groups. The existing areas where discharge of firearms is prohibited—American Flat Mill, Pine Nut Road No. 2, and the Moonrocks—would continue to protect the public from the discharge of firearms. Management of SRMAs where sanitation facilities are provided would maintain public health. Increased visitation and recreation would increase the number of individuals exploring the surrounding areas and the potential for hazards.

Effects under Alternative A

Alternative A would manage two areas as SRMAs. Although additional use could occur in these areas, additional management of these areas would lower the potential to affect public health and safety due to user conflict.

Effects under Alternative B

Alternative B would manage six areas as SRMAs, protecting recreation opportunities and promoting regional economic development. This alternative would also designate 1,678,300 acres as ERMA. If public use were to increase, there would be potential effects on public safety due to user conflicts; however, this alternative would also reduce potential impacts on public health through the installation of facilities.

Effects under Alternative C

Alternative C would manage three areas as SRMAs and would designate 1,528,800 acres as ERMA. A lower degree of concentrated public use would occur in the three SRMA and ERMA areas, as protection of cultural and natural resources would be emphasized. Alternative C would also decommission and rehabilitate roads, reducing access and the type of recreation use in ERMA.

Effects under Alternative D

Alternative D would manage four areas as SRMAs in order to protect recreation opportunities, with an emphasis on issues unique to the urban interface. This alternative also proposes the fewest acres (292,600) as ERMA. Management of some ERMA areas would include off-road motorcycle use. The impacts on public safety from potential user conflicts would be higher than under Alternative A.

Effects under Alternative E

Alternative E would manage six locations as SRMAs and 2,085,700 acres as ERMA. Alternative E also proposes issuance of nonmotorized competitive special recreation permits. Concentrated public use would increase the potential for user conflicts. These impacts would be reduced, as this alternative also provides mitigation of user conflicts.

Public Health and Safety: Effects from Comprehensive Travel and Transportation Management*Effects Common to All Alternatives*

Trails and travel management would affect public health and safety where it inadvertently allows access to hazardous sites. Public safety could be jeopardized due to exposure to hazards, including areas containing abandoned mines and illegal hazardous materials dump sites. Cross-country travel would also expose the public to surface conditions that have potential travel hazards, resulting in injuries from rollovers or collisions. Designating and maintaining specific travel routes would improve the potential for safe travel by public recreation users.

Effects under Alternative A

Alternative A proposes 3,840,300 acres as “open” to unrestricted cross-country travel, almost all of which would be outside of RMAs. Public exposure to safety hazards, such as abandoned mines, would be the highest compared to other alternatives, as more areas of BLM-administered lands would be accessible. Cross-country travel would also increase the potential for OHV travel accidents and injuries to users. Alternative A has the highest potential of impacts applicable to public safety of the alternatives.

Effects under Alternative B

Travel management under Alternative B proposes 95,300 acres as open to unrestricted cross-country vehicle use; any cross-country travel would be restricted to RMAs or designated playas. The management of each RMA should address and mitigate for any potential hazard that is identified. Therefore, the potential for exposure to hazardous sites or conditions would be substantially reduced compared to Alternative A.

Effects under Alternative C

Travel management under Alternative C proposes 1,300 acres as open to unrestricted cross-country vehicle use, and any cross-country travel would be restricted to RMAs or designated playas. The management of each RMA should address and mitigate for any potential hazard that is identified. Therefore, the potential for exposure to hazardous sites or conditions would be substantially reduced, compared to Alternative A.

Effects under Alternative D

Travel management under Alternative D proposes 22,700 acres as open to unrestricted cross-country vehicle use. The degree of public safety afforded would be higher and exposure to hazards would be lower, compared to Alternative A.

Effects under Alternative E

Travel management under Alternative E proposes 55,700 acres as open to unrestricted cross-country vehicle use. Public safety and exposure to hazards would be similar to Alternative B, but with 39,600 fewer acres open.

Public Health and Safety: Effects from Lands and Realty*Effects Common to All Alternatives*

Granting ROWs would provide additional public access and increase the potential for exposure into hazardous areas affecting public health and safety. These potential impacts would be reduced based on permit requirements, such as grant stipulations and maintenance requirements that would provide public safety.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Public Health and Safety: Effects from Renewable Energy

Effects Common to All Alternatives

Granting ROWs for energy development would improve public access and the potential for exposure into hazardous areas. Geothermal projects may present hazards from hot springs, affecting public safety. Hazards would be remediated based on implementing grant stipulations, mitigation measures, fencing, maintenance requirements, and access restrictions.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Public Health and Safety: Effects from Areas of Critical Environmental Concern

Effects Common to All Alternatives

Designating ACECs would increase public awareness and the potential for visitors to areas containing high resource values. Increased visitation could increase public exposure to hazards in surrounding areas and damage resources from increased populations.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Public Health and Safety: Effects from Public Health and Safety

Effects Common to All Alternatives

Identifying naturally occurring or human-made public safety hazards and taking appropriate action to protect public health and safety would reduce public exposure to safety hazards. Providing safety information would ensure the public is informed and aware of potential health and safety risks. Identifying locations of hazardous materials and unexploded ordnance, along with taking steps to mitigate impacts or remove hazardous materials and ordnance, would provide for public and safety. Remediating and installing signs at dangerous locations, such as mine shafts, adits, hot springs, and other dangerous areas, would protect public health and safety and reduce the potential for injuries. Closure of Harvey's Place within the Indian Creek RMA would reduce potential health and safety risks associated with discharged, filtered, secondary treated wastewater. Closure of American Flat Mill (10 acres), Pine Nut Road No. 2, and Moonrocks to discharge of firearms would also protect the public.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Public Health and Safety: Effects from Interpretation and Environmental Education

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

There are no management actions related to Interpretation and Environmental Education under Alternative A.

Effects under Alternative B

Alternative B provides for public education and interpretive opportunities that stress awareness of multiple use strategies, emphasizing resource use and economic development. Public use and visitation would be encouraged, resulting in higher visitation potential and increasing the potential for public exposure to health and safety risks. However, the public education opportunities would also promote increased understanding and awareness of the hazards they could encounter and how to handle them.

Effects under Alternative C

Alternative C provides education and interpretive opportunities that emphasize preservation and protection of resource. Public use and visitation would be discouraged in areas in order to preserve and protect important resource values. Lower visitation potential would occur, along with a lower potential for public exposure to health and safety risks. But it would also decrease the potential for public education and awareness of hazards on public lands.

Effects under Alternative D

Providing education and interpretive opportunities that balance multiple use and resource protection would encourage visitation and protect visitation in sensitive resource areas. Alternative D also emphasizes conflict resolution, reducing the potential for conflicts between users.

Effects under Alternative E

Impacts would be similar to Alternative D.

Public Health and Safety: Effects from Facilities and Transportation Maintenance

Effects Common to All Alternatives

Installing facilities and implementing transportation maintenance would promote public health through providing sanitation facilities and would provide public safety by reducing unsafe road conditions for travelers.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Public Health and Safety: Cumulative Impacts

Past and Present Actions

There are no quantifiable impacts on public safety from past and present management of climate change and livestock grazing. This is because few management actions have been implemented that affect public health or safety. Management to control invasive, nonnative, and noxious plants pose health risks from chemical treatments. These risks have been reduced by implementing mitigation measures, following label instructions, and complying with BLM policy.

Past lands and realty actions have had few impacts on public health and safety. Communication towers have improved public safety, as more areas are available to improved communication. Minerals development has improved access into areas with active exploration and mining. Fencing and installing signs in areas has reduced public safety risks. Past and present actions from renewable energy have had minimal impacts on public health and safety, as the number of renewable energy projects being implemented is relatively low.

Recreation management impacts on public health and safety has improved safety and health by providing facilities and sanitation in areas. As demands for public use of the lands increases, the potential for user conflicts has increased, posing safety and health issues. Recreation management to reduce conflict between users has provided for a higher degree of public safety.

Travel management as open to unrestricted motor vehicle travel allows the most public access into potentially hazardous areas or conditions. Cross-country travel also increases the risk for OHV accidents on BLM-administered lands. Past and present management has afforded the most acres as open to unrestricted motorized travel.

Vegetation management has had few impacts on public health and safety. Fuel treatments aid in reducing the potential for fire spread, protecting the public from large fires. Wildlife management would have no discernable impacts on public health and safety. Past and present management of wild horses and burros includes restricting access to the public during gathers and reducing

public exposure and safety risks from horses, vehicles, and aircraft. Fire management provides for public safety by prioritizing suppression to provide for public safety. Military use of public lands has increased the potential for user conflicts and safety concerns.

Reasonably Foreseeable Actions

Reasonably foreseeable future actions relating to climate change and livestock grazing would have no quantifiable impacts on public health and safety. Future actions relating to invasive, nonnative, and noxious weed management would increase the potential for health risks. This is because more areas would be treated with herbicides as expansion of nonnative noxious weeds continues.

Lands and realty reasonably foreseeable future actions would have similar impacts as past and present actions on public safety and health management. Mineral development impacts would be similar to those past and present actions. The dependence for renewable energy would increase facilities on BLM-administered lands. Public health and safety impacts would be commensurate with the number of facilities and locations developed and would remain low.

Foreseeable recreation management actions increasing the number of facilities for public use would provide for public health. Travel management would include more access restrictions and fewer acres available to unrestricted cross-country travel. Route designations would provide a route numbering or naming system that would allow the public to better locate their positions on public lands, increasing traveler safety. Public exposure to hazards would be lower.

Increasing demands on vegetation treatments would reduce fuels and provide for public safety. Reasonably foreseeable future actions applicable to wildlife management would have no discernable impacts on public health and safety.

Reasonably foreseeable future actions for wild horse and burro management would be the same as past and present management.

Reasonably foreseeable future actions include increasing management suppression priorities and fuel treatments. These would increase as WUI areas.

Continued military training and increased numbers or frequency would also increase user conflicts in and around training areas.

Incremental Cumulative Impact – Combined Past, Present, and Reasonably Foreseeable Actions under All Alternatives

There would be no incremental impacts from climate change or from livestock grazing on public health and safety. Incremental impacts from invasive, nonnative, and noxious weed management would increase exposure to chemical pesticides. Impacts would depend on the number of areas treated over time. Incremental impacts from lands and realty management would have minimal impacts on public health and safety. Incremental impacts from minerals

management would depend on the number of acres identified as open to mineral development. Closed areas would have fewer public safety risks from operations. Incremental effects from renewable energy would be low.

Incremental recreation management would provide for public health and would depend on the number of recreation facilities installed and management of areas to reduce user conflicts.

Travel management incremental effects would reduce the potential for public safety hazards. These would be offset by the increase in the number of people visiting BLM-administered lands.

Incremental effects from vegetation management have few impacts on public safety and would depend on the number and location of fuel treatments. There would be no discernable impacts on public health and safety based on wildlife management. Incremental impacts from wild horse and burro management would be the same as past, present, and reasonably foreseeable future actions. Public safety would depend on the number of gathers held.

Incremental effects from fire management would depend on the number and size of WUI areas that need protection. Further population growth and use of the BLM-administered lands would continue to impact suppression priorities.

Continued training by the military on public lands would increase the potential for user conflicts in areas that are used and around existing training areas and bombing ranges.

4.6.3 Interpretation and Environmental Education

This section discusses impacts on interpretation and environmental education activities from proposed management actions of other resources and resource uses. Existing conditions are described in **Section 3.5.3**, Interpretation and Environmental Education.

Summary

For all alternatives, the BLM would continue to provide opportunities for environmental education through its current programs. Interpretive opportunities would be provided through outreach programs, appropriate signs in high-use areas, and the development of distinct interpretive areas. All programs would stress the importance of environmental literacy, stewardship, and multiple use management. Depending on the theme of the alternative, interpretation and environmental education efforts focused on multiple use management would be emphasize different resources and resources uses.

Under Alternative A, current resource management actions would continue in their current form. Interpretation and environmental education would continue to be implemented as they are now. Impacts may occur in the future if management actions fail to protect natural resources, and interpretation and

environmental education could need to change their locations and primary messaging.

Under Alternative B, greater emphasis would be placed on resource use, and fewer natural resource protections would be put in place compared to Alternative A. This may increase the amount of land available for these uses, and outreach opportunities regarding responsible resource uses and their connection to the history of the region may increase. This may also decrease the availability and accessibility of these resources, and opportunities for interpretation, and environmental education concerning ecosystem services and ecosystem functions may also decrease.

Under Alternative C, greater emphasis would be placed on resource protection compared to Alternative A. This may increase the opportunities for interpretive sites and environmental education opportunities relating to ecosystem services and ecosystem function. Having more protected areas may also increase opportunities for expanding current interpretive and educational programs to new locations with unique ecological features. This may also decrease the opportunities available for interpretive and educational efforts related to responsible resource use due a decreased amount of land available for these uses.

Under Alternative D, a greater emphasis would be placed on BLM-lands within the urban interface compared to Alternative A. Changes in land tenure would be used to reduce conflicts between adjacent landowners. Depending on the ecological and resource values of exchanged lands, ecological and resource use outreach opportunities may stay the same, may be decreased by the loss of previously managed lands, or may increase by the addition of newly managed lands. All exchanges would be focused in areas at the urban interface. This would provide an opportunity to focus outreach on areas near population centers, but it may exclude important interpretative and educational opportunities that exist outside of this interface area.

Under Alternative E, a mix of management actions would be used to provide an intermediate level of resource management and use. Impacts may moderately improve interpretive and educational opportunities for both resource management and use across the entire planning area.

For each resource or resource use, individual impacts that are in addition to those described above are discussed in the corresponding sections.

Resources that would have no significant impact on interpretation and environmental education are air quality management, climate management, wildland fire ecology and management, visual resources management, forestry and woodland products management, backcountry wildlife conservation areas, tribal interests, and public health and safety.

Methods of Analysis

Methods and Assumptions

The following methods and assumptions were used to assess the impacts on interpretation and environmental education:

- Interpretive and environmental educational opportunities depend on the availability and accessibility to BLM-managed resources.
- The scale of resource use may increase or decrease the need for interpretive and environmental education services.
- Interpretive and environmental education focus outreach toward the public and therefore would be used in areas with high visitor use.
- The BLM will finalize the district-wide environmental education and interpretive strategy and its long-term interpretive plan, which will guide future interpretative and environmental education.

Indicators

The following indicators were used to assess the degree of impacts on interpretation and environmental education:

- Opportunities available for interpretation or environmental education about a specific resource or resource use
- Protection levels or public accessibility to BLM-managed resources
- Acres, special management, or facilities available for specific resource uses

Nature and Type of Effects

Resource management direction that increases public access increases opportunities for education and interpretation. Designation of areas such as RMAs provides opportunities for education and interpretation related to specific recreational experiences. Designation or management to protect unique and sensitive resources (such as ACECs, WSRs, and WSAs) may limit access to or uses in certain sensitive areas, but it provides an opportunity for education and interpretation of the resource for which the designation was made.

When broad-based management actions are related to interpretation and environmental education, it may be more difficult to implement projects due to a wide-array of options and lack of focus on a specific area. When specially managed areas are created, such as ACECs or historic districts, they provide specific locations and topics for outreach and may be more likely to be implemented.

Interpretation and Environmental Education: Effects from Soil Resources

Effects Common to All Alternatives

Under all alternatives, any proposed activities that are located in sensitive soils (e.g., hydric, saline, biological crusts, or highly erodible soils) would incorporate BMPs and other mitigation measures to minimize soil erosion and maintain soil stability. Depending on the location, accessibility, and visitor use of these sites, interpretive or educational installations could be created to showcase unique areas and the importance of protecting the sensitive resource.

Effects under Alternative A

In High Erosion Susceptibility Areas OHV use is causing sedimentation and erosion issues. Interpretive signs could be installed or educational materials could be distributed to educate the motorized recreation community on how to prevent further erosion by limiting use to designated roads and trails.

Effects under Alternative B

Alternative B would provide no new opportunities for interpretation and environmental education. (For interpretation and environmental education opportunities related to erosion for Alternative B, see *Effects from Comprehensive Travel and Transportation Management*.)

Effects under Alternatives C, D, and E

Alternatives C, D, and E would provide increased protections for biological soil crusts, compared to Alternative A. This could increase environmental education opportunities on the ecological function of this type of sensitive soil.

Interpretation and Environmental Education: Effects from Water Resources

Effects Common to All Alternatives

Under all alternatives, watershed function would be defined so the BLM could make management decisions based on cumulative effects within watersheds and or neighboring watersheds. This may include collaborating with other federal agencies, tribal governments, the States of Nevada and California, counties, and local municipalities on management of municipal watersheds. This would provide broad-based opportunities to expand interpretive and education programs about watershed science and management.

Effects under Alternative A

Current management actions would limit BLM-authorized activities in degraded or degrading watersheds, allowing for some opportunities for interpretation and environmental education on watershed science and management.

Effects under Alternative B

Alternative B would have no additional opportunities for interpretation and environmental education than those under *Effects Common to All Alternatives*.

Effects under Alternatives C, D, and E

Alternatives C, D, and E would manage for water conservation through restoration projects. It may provide more opportunities than Alternative A for interpretation and environmental education at restored sites.

Interpretation and Environmental Education: Effects from Vegetation Resources

Effects Common to All Alternatives

Under all alternatives, the BLM would manage for healthy forests, woodland and rangeland vegetative communities, and riparian areas. Broad-based interpretive and educational efforts would have expanded opportunities to emphasize the importance of properly functioning ecosystems as part of youth and adult outreach activities and materials. Additionally, management actions would focus on minimizing the introduction and spread of invasive and noxious plants, another important educational topic for properly functioning ecosystems.

Effects under Alternative A

Alternative A would continue working toward improving rangeland health and riparian areas, increasing ground cover to prevent soil erosion, and coordinating with the Navy on invasive weed management. There would be no additional opportunities for interpretation and environmental education from those identified in *Effects Common to All Alternatives*.

Effects under Alternatives B, C, D, and E

Alternatives B, C, D, and E would have a greater emphasis on vegetative restoration and rehabilitation than Alternative A. This may allow for additional interpretation and environmental education opportunities at restored sites.

Interpretation and Environmental Education: Effects from Fish and Wildlife Management

Effects Common to All Alternatives

Under all alternatives, management actions would support partnership opportunities for state and nonprofit groups to assist with monitoring, identification, and protection of fish, wildlife, and plants. This would provide additional broad-based opportunities to engage public volunteers in ecosystem science and management education.

Effects under Alternative A

Alternative A would provide no additional opportunities for interpretation and environmental education from those identified in *Impacts Common to All Alternatives*.

Effects under Alternatives B, C, D, and E

Alternatives B, C, D, and E would allow for habitat improvement projects, including the removal of invasive species. This could allow for additional

interpretation and environmental education opportunities at improved sites. As part of the management of bats, the BLM would close access to caves in the event of a white-nose syndrome outbreak or other transmittable disease, providing another opportunity to provide educational materials to those who recreate in and around caves. Management actions would also dictate that the BLM work with the Swan Lake Nature Study Area Advisory Board to increase educational outreach activities and opportunities.

Interpretation and Environmental Education: Effects from Special Status Species Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would continue to manage one ACEC for the protection of special status plants species and one ACEC for special status wildlife species. Alternative A would also support the reintroduction of sensitive and endemic species. The management of such areas and actions would provide some opportunities for interpretation and environmental education about the habitat and management of special status and sensitive species.

Effects under Alternative B

Alternative B would establish three ACECs for special status plants, one ACEC for special status wildlife, and additional protections for the Greater Sage-Grouse, allowing for slightly more interpretation and environmental education opportunities than would be available under Alternative A. As part of the management of bats, the BLM would close access to caves in the event of a white-nose syndrome outbreak or other transmittable disease. This would be another opportunity to provide educational materials to those who recreate in and around caves, as compared to Alternative A.

Effects under Alternative C

Alternative C would establish five ACECs for special status plants and seven ACECs for special status wildlife and would support the reintroduction of special status species to appropriate areas. It would create additional protections for the Greater Sage-Grouse, allowing for substantially more interpretation and environmental education opportunities than would be available under Alternative A. Impacts of management for bats would be as discussed under Alternative B.

Effects under Alternative D

Alternative D would establish three ACECs for special status plants and no ACECs for special status wildlife. It would create additional protections for the Greater Sage-Grouse, allowing for similar interpretation and environmental education opportunities as would be available under Alternative A. Impacts of management for bats would be as discussed under Alternative B.

Effects under Alternative E

Alternative E would establish two ACECs for special status plants and no ACECs for special status wildlife. It would support the reintroduction of special status species to appropriate areas and additional protections for the Greater Sage-Grouse. This would allow for slightly more interpretation and environmental education opportunities than would be available under Alternative A. Impacts of management for bats would be as discussed under Alternative B.

Interpretation and Environmental Education: Effects from Wild Horse and Burro Management

Effects Common to All Alternatives

Under all management actions, the BLM would manage for healthy animals in balance with other uses and the productive capacity of their habitat within HMAs. All alternatives would provide opportunities for interpretation- and environmental education-related BLM-management actions within HMAs and wild horse and burro adoption events. The number of opportunities would be related to the number and acreage of HMAs under each alternative.

Effects under Alternative A

Alternative A would maintain or improve the conditions of 1,235,200 acres of public rangeland for wild horses and burros within 19 HMAs, providing various opportunities for interpretation and environmental education.

Effects under Alternative B

Alternative B would manage 13 HMAs, consisting of 996,500 acres of wild horse and burro habitat, providing fewer opportunities for interpretation and environmental education than Alternative A. Alternative B would also allow working with the Lahontan State Park to allow wild horses access to water and food within the park. This may provide additional opportunities for interpretation and environmental education efforts related to wild horse and burros compared to Alternative A.

Effects under Alternative C

Alternative B would manage 12 HMAs consisting of 1,090,000 acres of wild horse and burro habitat, providing fewer opportunities for interpretation and environmental education than Alternative A. Alternative C would seek innovative solutions through a cooperative relationship with local communities and other organizations regarding wild horses and burros outside HMAs. This may provide additional opportunities for interpretation and environmental education related to wild horses and burros compared to Alternative A.

Effects under Alternative D

Alternative D would manage 13 HMAs, consisting of 996,500 acres of wild horse and burro habitat, providing fewer opportunities for interpretation and environmental education than Alternative A.

Effects under Alternative E

Alternative E would manage 12 HMAs, consisting of 1,070,200 acres of wild horse and burro habitat, providing fewer opportunities for interpretation and environmental education than Alternative A. Additional effects would be the same as those identified under Alternatives B and C.

Interpretation and Environmental Education: Effects from Cultural Resources Management

Effects Common to All Alternatives

Under all alternatives, management of cultural resources would promote opportunities for educational and interpretive uses of cultural resources. The number of opportunities available for interpretive and educational work would depend on the cultural resources and protections provided under each alternative, such as specially managed areas and ACECs for cultural resource protection.

Effects under Alternative A

Alternative A would manage one ACEC for the protection of cultural resources, would develop public outreach and education efforts focused on conservation ethics, and would promote interpretation at the following locations:

- Grimes Point Archaeological District
- Hidden Cave
- Pony Express Stations at Sand Springs and Cold Springs
- Cold Springs Telegraph and Stage Stations
- New Pass Overland Stage Station

All of these efforts would provide opportunities for interpretation and environmental education about the cultural resources in the planning area.

Effects under Alternative B

Alternative B would establish eight ACECs for the protection of cultural resources. It would manage historic roads and trail that are eligible for listing on the NRHP but are not congressionally designated, and it would protect rock art sites, NRHP-listed properties and districts, National Historic Landmarks, and TCPs. These efforts would provide many additional opportunities for interpretation and environmental education efforts related to cultural resources compared to Alternative A.

Effects under Alternative C

Management actions under Alternative C would be similar to those identified under Alternative B, with the exception that nine ACECs would be established and that educational and research opportunities would be promoted at areas

with high cultural site density. Effects would be the same as those identified under Alternative B.

Effects under Alternative D

Management actions under Alternative D would be similar to those identified under Alternative C, except that only six ACECs would be established. These efforts would provide some additional opportunities for interpretation and environmental education related to cultural resources compared to Alternative A.

Effects under Alternative E

Management actions under Alternative E would be similar to those identified under Alternative C, except that only three ACECs would be established. In addition, 15,900 acres would be designated as the Wyemaha Archaeological District for the protection of cultural resources. Part of the management of this area includes providing educational opportunities, establishing interpretive site tours, and developing an interpretive center. These efforts would provide substantially more opportunities for interpretation and environmental education of cultural resources compared to Alternative A.

Interpretation and Environmental Education: Effects from Paleontological Resources Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would provide for the management of one ACEC for the protection of paleontological resources and a broad-based goal of managing paleontological resources for educational use. These would provide limited opportunities for interpretation and environmental education related to paleontological resources.

Effects under Alternative B

Alternative B would establish two ACECs for the protection of paleontological resources and would develop currently known paleontological resources for uses in public education. This would provide additional opportunities for interpretation and environmental education related to paleontological resources compared to Alternative A.

Effects under Alternative C

Effects would be the same as those identified under Alternative B.

Effects under Alternative D

Management actions under Alternative D would be similar to those identified under Alternative B, except that only one ACEC would be established for the protection of paleontological resources. This would provide additional

opportunities for interpretation and environmental education related to paleontological resources compared to Alternative A.

Effects under Alternative E

Effects would be the same as those identified under Alternative B.

Interpretation and Environmental Education: Effects from Caves and Cave Resources Management

Effects Common to All Alternatives

Under all alternatives, management would pursue partnership and volunteer site steward involvement for site monitoring and protection. It would promote visitor awareness of the potential risks in cave environments and would designate the following as having cultural, biological, educational, or scientific significance: Hidden Cave, Burnt Cave, Cowboy Cave, Fish Cave, Eastgate Shelter, Picnic Cave, Salt Cave, Spirit Cave, Dynamite Cave, Topia Cave, and other caves as identified. These broad-based management actions would provide some educational opportunities to involve the public through volunteer activities and outreach materials.

Effects under Alternative A

Alternative A would provide no additional interpretation and environmental education opportunities from those identified in *Effects Common to All Alternatives*.

Effects under Alternative B

Alternative B would allow for the development of public education and outreach programs to foster an appreciation and understanding of caves, as well as cultural and biological cave resources. This would provide some additional broad-based opportunities for interpretation and environmental education related to caves and cave resources compared to Alternative A.

Effects under Alternative C

Effects would be the same as those identified under Alternative B.

Effects under Alternative D

Effects would be the same as those identified under Alternative B.

Effects under Alternative E

Alternative E would be the same as Alternative B, with opportunities to increase public education and interpretation at Hidden Cave. This would provide some additional broad-based and site-specific opportunities for interpretation and environmental education efforts related to caves and cave resources compared to Alternative A.

Interpretation and Environmental Education: Effects from Livestock Grazing Management

Effects Common to All Alternatives

Under all alternatives, livestock grazing may be considered part of the heritage of an area. This may provide opportunities for interpretation about the culture and the history of livestock grazing, as well as environmental education opportunities on the management of livestock regardless of the acres available for livestock grazing.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Interpretation and Environmental Education: Effects from Geology and Mineral Management

Effects Common to All Alternatives

Under all alternatives, management actions would maintain the integrity of important noneconomic geologic resources consistent with other land use objectives. Depending on the geologic value and uniqueness of these geologic resources, interpretive or educational materials could be created for specific sites.

Effects under Alternative A

Alternative A would provide no additional opportunities for interpretation and environmental education about geology and minerals management than those identified under *Effects Common to All Alternatives*.

Effects under Alternative B

Alternative B would allow for reclamation or restoration of disturbed lands, which could allow for additional interpretation and environmental education opportunities at reclaimed sites compared to Alternative A. Also, with the focus of this alternative being resource use and economic development, having more mineral extraction operations in place may allow for increased educational

materials on extractive resources and processes, such as geothermal and locatable minerals, compared to Alternative A.

Effects under Alternative C

Alternative C would allow for reclamation or restoration of disturbed lands, which could allow for additional interpretation and environmental education opportunities at reclaimed sites compared to Alternative A.

Effects under Alternative D

Effects would be the same as those identified under Alternative C.

Effects under Alternative E

Effects would be the same as those identified under Alternative C.

Interpretation and Environmental Education: Effects from Recreation and Visitor Services

Effects Common to All Alternatives

Under all alternatives, management actions would increase public awareness of recreation opportunities and experiences through interpretation, education, and stewardship principles. Management actions would also support the planning and implementation of recreational trails in cooperation with city and county governments. They would support partnerships for cooperative funding, stewardship, monitoring, operations, and maintenance for trails. These collaborative efforts would provide opportunities for interpretation and education through volunteer efforts, signs along the trails, and outreach events related to recreation and visitor services.

Effects under Alternative A

Alternative A would provide few additional opportunities for interpretation and environmental education, other than those identified in *Effects Common to All Alternatives*, including constructing an interpretive trail at Jumbo Postpile and developing a day use picnic area with interpretation kiosk at Red Rocks Scenic Area.

Effects under Alternative B

Alternative B would provide a moderate to significant increase in opportunities for interpretation and environmental education compared to Alternative A. Additional opportunities are as follows:

- Managing the Alpine SRMA for interpretation and environmental education
- Providing educational materials for abandoned mine lands at Sand Mountain SRMA

- Designating 102 Ranch and Mustang ERMA for casual use and dispersed recreation opportunities that emphasize environmental education and interpretation
- Providing interpretive and educational materials for unique or significant historical and cultural features and sites in the Middlegate SRMA
- Developing educational and interpretive signs for trail systems and historical sites
- Providing educational materials for abandoned mine lands in the Mina ERMA
- Developing educational and interpretive signs for trail systems in the Pine Nut ERMA

The development and management of target shooting ranges could also provide additional opportunities for interpretation and education on the impacts of shooting on the surrounding ecosystems.

Effects under Alternative C

Alternative C would provide a moderate increase in opportunities for interpretation and environmental education compared to Alternative A. Additional opportunities are as follows:

- Managing the Alpine SRMA for interpretation and environmental education
- Designating 102 Ranch and Mustang ERMA for casual use and dispersed recreation opportunities that emphasize environmental education and interpretation
- Designating the Faye-Luther ERMA for day use recreation, including interpretation
- Developing educational and interpretive signs for trail systems in the Pine Nut ERMA.

The development and management of target shooting ranges could also provide additional opportunities for interpretation and education on the impacts of shooting on the surrounding ecosystems.

Effects under Alternative D

Alternative D would provide a moderate to significant increase in opportunities for interpretation and environmental education compared to Alternative A. Additional opportunities are as follows:

- Managing the Alpine SRMA for interpretation and environmental education

- Developing educational and interpretive signs for trail systems in the Hungry Valley SRMA
- Designating 102 Ranch and Mustang ERMA for casual use and dispersed recreation opportunities that emphasize environmental education and interpretation
- Designating the Faye-Luther ERMA for day use recreation opportunities, including interpretation
- Developing educational and interpretive signs for trail systems in the Pine Nut ERMA

The development and management of target shooting ranges could also provide additional opportunities for interpretation and education on the impacts of shooting on the surrounding ecosystems.

Effects under Alternative E

Alternative E would provide a significant increase in opportunities for interpretation and environmental education compared to Alternative A. Additional opportunities are as follows:

- Managing the Alpine SRMA for interpretation and environmental education
- Developing educational and interpretive signs for trail systems in the Hungry Valley SRMA
- Managing the Sand Springs Pony Express Station and NHT for historical interpretation
- Providing educational materials to recreationists for abandoned mine lands at Sand Mountain SRMA
- Designating 102 Ranch and Mustang ERMA for casual use and dispersed recreation opportunities that emphasize environmental education and interpretation
- Designating the Faye-Luther ERMA for day use recreation opportunities, including interpretation
- Developing a day use rest stop picnic area with an interpretive kiosk in the Lassen Red Rock RMZ
- Developing educational and interpretive signs for trail systems in the Pine Nut ERMA
- Developing the Jumbo Post Pile Interpretive Trail and trailhead as well as a Jumbo Post Pile site plan, to include site boundary, parking area, interpretive plan, and sign plan, and trailhead kiosk in the Virginia Range ERMA

The development and management of target shooting ranges could also provide additional opportunities for interpretation and education on the impacts of shooting on the surrounding ecosystems.

Interpretation and Environmental Education: Effects from Comprehensive Travel and Transportation Management

Effects Common to All Alternatives

Where OHV use is causing sedimentation and erosion issues, or where OHV operators are using riparian corridors, interpretive signs or educational materials could be distributed to educate the motorized recreation community of how to prevent further erosion by limiting use to designated roads and trails.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Interpretation and Environmental Education: Effects from Lands and Realty

Effects Common to All Alternatives

The acquisition of lands that improve the management of BLM-administered lands or resource values may increase the continuity or overall value of a resource in an area. Situations where an acquisition includes a unique resource or improves the continuity of a unique resource may provide an opportunity for interpretation and environmental education. Disposal of BLM-administered lands tend to have little or no resource value and would not have a significant impact on interpretation and environmental education. However, if disposed lands include unique or sensitive resource, this may decrease outreach opportunities.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Interpretation and Environmental Education: Effects from Renewable Energy

Effects Common to All Alternatives

Under all alternatives, renewable energy projects could be a focus of interpretative and educational efforts on new methods of energy production. The more acres that are available for solar and wind projects, the greater the potential for a utility-scale renewable energy project and associated outreach efforts.

Effects under Alternative A

Alternative A would manage 905,900 acres as solar variance, allowing utility-scale solar development on these lands.

Effects under Alternative B

Alternative B would manage 773,400 acres as solar variance, allowing utility-scale solar development on these lands; 1,220,200 acres would be managed as ROW avoidance areas for wind projects. There would be fewer acres available for both solar and wind projects, and potentially fewer opportunities would be available for interpretation and environmental education compared to Alternative A.

Effects under Alternative C

Alternative C would manage 578,400 acres as solar variance, allowing utility-scale solar development on these lands; 2,073,200 acres would be managed as ROW exclusion areas for wind projects. There would be fewer acres available for both solar and wind projects, and potentially fewer opportunities would be available for interpretation and environmental education compared to Alternative A.

Effects under Alternative D

Alternative D would manage 672,100 acres as solar variance, allowing utility-scale solar development on these lands; 1,228,100 acres would be managed as ROW avoidance areas for wind projects. There would be fewer acres available for both solar and wind projects, and potentially fewer opportunities would be available for interpretation and environmental education compared to Alternative A.

Effects under Alternative E

Alternative E would manage 629,900 acres as solar variance, allowing utility-scale solar development on these lands; 956,900 acres would be managed as ROW avoidance areas, and 629,900 acres would be managed as ROW exclusion areas for wind projects. There would be fewer acres available for both solar and wind projects, and potentially fewer opportunities would be available for interpretation and environmental education compared to Alternative A.

Interpretation and Environmental Education: Effects from Areas of Critical Environmental Concern

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would manage for six ACECs, none of which specifically call for interpretation or environmental education efforts. Depending on the management priorities and resources within the ACEC, interpretive or educational activities or materials could be created for these ACECs. Examples of these priorities and resources are unique geologic features, cultural resources, and paleontological resources.

Effects under Alternative B

Alternative B would provide a significant increase in opportunities for interpretation and environmental education compared to Alternative A. Additional opportunities are as follows:

- Providing research and educational opportunities in Black Mountain/Pistone Archaeological District ACEC, Fox Peak Cultural ACEC, Grimes Point Archaeological District ACEC, Namazii Wunu Cultural ACEC, Pah Rah High Basin Petroglyph ACEC, and the Tagim aša Cultural ACEC
- Working with local community and tribal entities to establish interpretive tours in the Black Mountain/Pistone Archaeological District ACEC, Grimes Point Archaeological District ACEC, and the Pah Rah High Basin Petroglyph ACEC
- Allowing geological research and educational opportunities
- Providing for on-site interpretation of the geological features
- Developing parking/day use area and interpretative kiosks in the Incandescent Rocks Scenic ACEC
- Providing for interpretation and educational opportunities in the Ruhenstroth Paleontological ACEC and the Virginia City National Landmark Historic District ACEC
- Developing self-guided interpretive signs and trail systems

- Pursuing development of docent-led interpretive programs through Mineral County or educational institutions in the Stewart Valley Paleontological ACEC

Effects under Alternative C

Alternative C would provide a low to moderate increase in interpretation and environmental education opportunities compared to Alternative A. Additional opportunities are as follows:

- Managing the Sand Springs Pony Express Station and Pony Express NHT for historical interpretation and maintaining the Sand Springs Interpretive Trail in the Sand Springs Desert Study Area ACEC
- Providing: research and educational opportunities in the Stewart Valley Paleontological ACEC
- Partnering with community groups and local government to support preservation and interpretation of the historic resources in the Virginia City National Landmark Historic District ACEC

Effects under Alternative D

Alternative D would provide a significant increase in interpretation and environmental education opportunities compared to Alternative A. Additional opportunities are as follows:

- Providing for research and educational opportunities in the Black Mountain/Pistone Archaeological District ACEC, Fox Peak Cultural ACEC, Grimes Point Archaeological District ACEC, and the Tagim aša Cultural ACEC
- Working with local community and tribal entities to establish interpretive tours in the Black Mountain/Pistone Archaeological District ACEC and the Grimes Point Archaeological District ACEC
- Allowing geological research and educational opportunities
- Providing onsite interpretation of the geological features
- Developing parking/day use area and interpretative kiosks in the Incandescent Rocks Scenic ACEC
- Developing a public education/outreach program to increase public appreciation and understanding of cultural resources in the Pah Rah High Basin Petroglyph ACEC
- Developing interpretation in areas with high paleontological values in the Ruhenstroth Paleontological ACEC
- Developing a public education/outreach program designed to increase public appreciation and understanding of these cultural resources and tribal heritage in the Tagim aša Cultural ACEC

- Partnering with community groups and local government to support preservation and interpretation of the historic resources in the Virginia City National Landmark Historic District ACEC

Effects under Alternative E

Alternative D would provide a moderate increase in opportunities for interpretation and environmental education opportunities compared to Alternative A. Additional opportunities are as follows:

- Providing for research and educational opportunities in Fox Peak Cultural ACEC, Grimes Point Archaeological District ACEC, and the Stewart Valley Paleontological ACEC
- Working with local community and tribal entities to establish interpretive tours in the Grimes Point Archaeological District ACEC
- Allowing geological research and educational opportunities and providing interpretation of the geological features in the Incandescent Rocks Scenic ACEC
- Developing public education/outreach program designed to increase public appreciation and understanding of cultural resources in the Pah Rah High Basin Petroglyph ACEC
- Developing interpretation in areas with high paleontological values in the Ruhenstroth Paleontological ACEC

Interpretation and Environmental Education: Effects from Back Country Byways

Effects Common to All Alternatives

Under all alternatives, management actions would partner with state and local agencies to develop new or modify existing Back Country Byways to allow for public exploration of Nevada's unique history, culture, and landscapes and providing opportunities for interpretive or educational efforts along the byways focused on these topics.

Effects under Alternative A

Management actions under Alternative A for National Historic Trails would continue to manage 67 miles of the Fort Churchill Back Country Byway, providing for interpretation and environmental education opportunities along this route.

Effects under Alternative B

Alternative B would designate the Fort Churchill, Marietta, and New Pass to Hawthorne Back Country Byways, providing a moderate increase in interpretation and environmental education opportunities compared to Alternative A. Additional opportunities are as follows:

- Providing interpretation of the historical mining features of Candelaria and Marietta Mining Districts, along with the Marietta Wild Burro Range and Teels Marsh in the Marietta Back Country Byway
- Providing interpretation for historical and archaeological features along the New Pass to Hawthorne Back Country Byway

Effects under Alternative C

Management actions under Alternative C would be similar to those identified under Alternative B; however, the interpretation of the Marietta Back Country Byway would focus on the natural and scenic values of Teels Marsh and the Marietta Wild Burro Range, while the interpretation for the New Pass to Hawthorne Back Country Byway would focus on the natural and scenic values of Lodi Valley and the Gillis Mountain Range.

Effects under Alternative D

Alternative D would designate no Back Country Byways, providing no opportunities for interpretation and environmental education. There would be far fewer opportunities for outreach as compared to Alternative A.

Effects under Alternative E

Management actions under Alternative E are similar to those under Alternative B. Effects would be the same as those identified under Alternative B.

Interpretation and Environmental Education: Effects from National Trails

Effects Common to All Alternatives

Under all alternatives, management for National Historic Trails would work toward establishing collaborative partnerships with the National Park Service, National Trails Centers, partner groups, interest groups, interested individuals, local communities, and other stakeholders to implement Pony Express and California Trail-related projects. These partnerships would provide many opportunities to create interpretive and educational materials related to these national trails.

Effects under Alternative A

Alternative A would promote visitation, interpretation, and development of the Sand Springs and Cold Springs Pony Express Stations. It would maintain the current self-guided interpretive trails and informational signs at the Sand Springs and Cold Springs Pony Express Stations. These would provide continued interpretation and educational opportunities for these National Historic Trails. There are no management actions for the Grimes Point National Recreation Trail under Alternative A.

Effects under Alternative B

Alternative B would provide more opportunities for interpretation as compared to Alternative A. Additional opportunities are as follows:

- Installing interpretative signs along National Historic Trails
- Using interpretation and education to help mitigate damage to segments of the California National Historic Trail
- Developing interpretive materials for the petroglyphs along the Grimes Point National Recreation Trail

Interpretation and education on the Sand Springs and Cold Spring Pony Express Stations would be covered under cultural resources for this alternative.

Effects under Alternative C

Alternative C would provide fewer opportunities for interpretation compared to Alternative A. The only opportunity would be developing interpretive materials for the petroglyphs along the Grimes Point National Recreation Trail. Interpretation and education on the Sand Springs and Cold Spring Pony Express Stations would be covered under ACECs and cultural resources for this alternative.

Effects under Alternative D

Management actions under Alternative D would be similar to those under Alternative B, except the Sand Springs and Cold Spring Pony Express Stations would have no management actions. This would provide fewer opportunities for interpretation and education compared to Alternative A.

Effects under Alternative E

Management actions under Alternative E would be similar to those under Alternative B, except that management actions for Sand Springs and Cold Spring Pony Express Stations would be covered under SRMAs and cultural resources for this alternative. Effects would be the same as those identified under Alternative B.

Interpretation and Environmental Education: Effects from Wild and Scenic Rivers

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would manage three segments of the East Fork Carson River as eligible for inclusion as Wild, Recreational, or Scenic Rivers under the NWSRS. If these segments become designed as a WSR in the future, then it would provide additional opportunities for interpretation and education on the NWSRS and the unique features of these segments of river.

Effects under Alternative B

Alternative B would determine that the three segments of the East Fork Carson River are not suitable for inclusion in the NWSRS and release them from special management. This would provide no opportunities for interpretation and education on the NWSRS and the unique features of these segments of river, much fewer opportunities than Alternative A.

Effects under Alternative C

Alternative B recommends the three segments of the East Fork River as suitable for inclusion in the WSR System. Nomination of these segments as suitable would provide additional opportunities for education and would likely increase the level of visitor use to the river, further enhancing educational opportunities.

Effects under Alternative D

Effects would be the same as those identified under Alternative C.

Effects under Alternative E

Effects would be the same as those identified under Alternative C.

Interpretation and Environmental Education: Effects from Wilderness Study Areas

Effects Common to All Alternatives

Under all alternatives, WSAs would be managed to retain their wilderness characteristics, providing opportunities for interpretation and education on the wilderness classification process and unique features within each WSAs. Group sizes and motorized use limitations under all alternatives would somewhat limit access to WSAs, but opportunities exist particularly for educational experiences related to more primitive recreation. If WSAs become designated as Wilderness, then these types of opportunities would continue to exist. If they were released from consideration, they may lose some of their wilderness characteristics and interpretive and educational opportunities.

Effects under Alternative A

Lands classified as WSAs would continue to be managed under BLM policy for WSAs, which includes limited motorized use and closures to new mineral development. No special management would be in place for the area should the WSAs be released from consideration; therefore, no opportunities for education and interpretation would exist in this circumstance.

Effects under Alternative B

Under Alternative B, WSAs would be managed under BLM policy for WSAs, as discussed in Alternative A. Should the WSAs be released from consideration, VRM Class II designation would provide some protection for the natural setting and primitive recreation values; however, lack of special designation would likely decrease visitation and related opportunities for education.

Effects under Alternative C

Impacts would be as described for Alternative B, with additional protective measures to limit development in WSAs should they be released from consideration. Protection of these areas would continue the ability to use WSAs as special areas for education and interpretation.

Effects under Alternative D

Impacts would be as described under Alternative C.

Effects under Alternative E

Impacts would be as described under Alternative C.

Interpretation and Environmental Education: Cumulative Impacts

The focus of interpretation and environmental education would be placed on enhancing the visitor experience on CCD lands. Also emphasized would be educating current and future generations on land management issues, adapting as needed to changes in the region and available opportunities. The population of the region, in particular the greater Reno area, is expected to continue growing, creating a stronger need and more opportunities for interpretive and educational outreach programs related to recreation, cultural, and historical issues. The progression or intensification of natural processes, such as wildland fires, invasive species, and climate change, may also create a stronger need for these types of programs.

4.6.4 Social and Economic Conditions

Summary

Social and economic impacts would occur with the implementation of any of the alternatives. Potential impacts include changes in the following:

- Employment and income
- Tax revenue for local, state, and federal government entities
- Demand for housing and government services

In addition, management actions could alter public attitudes and opinions concerning use of BLM-administered lands. This section describes potential impacts on socioeconomics from management actions. Existing conditions are described in **Section 3.4.3, Socioeconomics**.

Under Alternative A, current management practices would continue, and there would be no changes to the social and economic indicators below. Impacts may occur if there were drastic changes within the planning area and management actions were not updated accordingly. Under Alternative B, resources use and economic development would be prioritized and would provide the most resources and areas available for economic development. Development also would provide the highest level of opportunity for extractive and land intensive

industries, such as energy development and motorized recreation. It would provide the fewest surface acres of occupancy restrictions, special stipulations, and exclusion areas to protect water resources, cultural and paleontological resources, soil resources, wildlife habitat, and vegetation. This could also reduce nonmarket values, such as open space, scenic values, and solitude.

Alternative C would preserve and protect ecosystem health, with the most acres under management restrictions, which could enhance nonmarket values but could also hinder market-based economic activities. Alternative D focuses on the interface between BLM-administered lands and urban environments. It would increase management actions in this zone, with related changes to market and nonmarket economic factors also.

Alternatives D and E fall in between Alternatives B and C in terms of land use opportunities and resource protections. They would allow for some extractive resource uses and related economic impacts but would provide some protection for nonmarket factors.

Under all alternatives, the BLM would continue to consider socioeconomic impacts of site-specific actions and incorporate socioeconomic issues into future analyses of environmental, social, and economic impacts, such as the NEPA-required analyses for site-specific actions.

None of the alternatives would directly change population or demand for housing, schools, public facilities, or public services, such as police enforcement or access to hospitals, for the general public or environmental justice populations.

Methods of Analysis

Methods and Assumptions

Impact analyses and conclusions are based on the existing and projected population, employment, income, housing, earnings, social values, and economic contribution of public lands, as described in the Carson City District Socioeconomic Baseline Report and in **Chapter 3** of this document. The following assumptions were used to assess the impacts on social and economic conditions:

- Restrictions in land available for implementing SOPs, BMPs, or mitigation measures to protect other resources could indirectly affect socioeconomics by increasing costs or precluding development.
- Travel management decisions could increase or decrease motorized and nonmotorized recreation or economic opportunities on public lands. Improved access may benefit local economic activity, while

reduced access may result in a negative impact on the local economies.

- Increased population growth and relocation would increase economic activity and improve local economies, but it could alter the local social setting and strain public services, depending on the rate and level of growth.
- Changing ownership from public lands to private lands (land tenure adjustments) would expand state and local tax bases and encourage development. This could improve the local economies but may also impact the quality of life for local residents who value public land use and reduce revenues generated from recreational uses of public lands.
- Closing areas for certain uses could negatively impact local economies.
- Restrictions and closures specifically to protect threatened or endangered species could reduce economic activities in the closed areas or could increase operational expenses. Measures to protect threatened and endangered species, however, may contribute to long-term persistence of the species and provide nonmarket benefits.

Indicators

Key indicators that are used in the social and economic impact analysis are as follows:

BLM-Administered Land Contributions

- Recreation use (e.g., recreation visitor days, visitor use numbers, SRP permits, and fees)
- Land disposal (e.g., land swaps with local communities)
- Grazing AUMs
- Geothermal production
- Minerals (salable, other leasables, and locatables)
- Environmental/ecological restoration (acres)
- Land use and ROWs (acres)
- Ecosystem services

Social and Economic Contributions

- Population (growth projections)
- Changing demographics (selected indicators)
- Employment (numbers by sector)

- Income (personal income)
- Ethnic and racial characteristics of the region
- Open space (land enhancement value and attracting nonlabor income)

Nature and Type of Effects

Socioeconomic impacts from the proposed actions in the planning area are principally related to management actions that change the level of permitted resource use, including recreation, livestock grazing, and renewable energy development. Changes in levels of use can directly and indirectly affect the number of jobs and amount of money spent in the local region related to resource uses. Actions from resource programs or constraints (as described for each alternative) that impact surface uses (e.g., surface-disturbing activities that impact the amount of land available for grazing) are included by implication.

In addition to economic impacts, management actions can also result in nonmarket impacts on social values and sense of place. Market and nonmarket impacts are further discussed by resource below.

Recreation

Impacts from recreation on BLM-administered land at the state level in 2012 were estimated at \$332.7 million, and total impacts (direct, indirect, and induced) were estimated at \$547.6 million (BLM 2012m). Due to the location of the planning area near urban areas, recreation plays an important role in the local economy by contributing directly through the purchase of access fees, special use permits, and the services of local guides and outfitters, and indirectly through the purchase of commodities, such as gasoline, accommodations, and food and beverage. In addition, access to recreation plays a role in attracting and retaining area residents and enhancing quality of life.

Recreation in the area is projected to continue to increase as the local population increases. Spending and economic impacts from recreation vary based on the type of activities that visitors engage in as spending patterns vary by activity. Visitor spending was estimated at \$182 per overnight visit for OHV use, \$343 of biking, \$276 for hiking, \$250 for hunting, and \$104 for primitive camping in Forest Service National Visitor Use Surveys (Forest Service 2005).

Changes in spending and visitor experience would result from the number, type, and acreage of RMAs. SRMAs are intensely managed for specific recreation and visitor services and therefore are expected to attract more recreationists, to have a greater economic impact from purchases of goods and services, and to fulfill visitors' social values, such as an improved recreation experience and greater access to facilities. Recreation within ERMAs is managed less intensively commensurate with other resource uses. Management focus is directed towards an undeveloped character and dispersed activities, which may attract fewer recreationists.

Economic benefits to the local economy would be less than realized for SRMAs but would fulfill the demand for other recreational and social values, such as solitude, open spaces, and fewer regulations. ERMAs focus on dispersed recreation with an undeveloped character, with little management, aside from custodial actions. Fewer types of RMAs are expected to have greater economic and social impacts than areas outside of RMAs, which are not managed for recreation but may allow for it.

Hunting, fishing, and wildlife viewing also contribute to the local and regional economy. Management actions that protect fish habitat could improve fisheries for recreation, which can bring visitor expenditures into the local economy; similarly, actions improving wildlife habitat can improve wildlife watching and hunting, both of which can inject tourist dollars into the local economy. In 2011, Nevada accounted for 1,400,000 participant days for fishing, 748,000 for hunting, and 1.6 million for wildlife watching, with total direct expenditures of over \$1 billion (**Table 4-24**, Hunting and Fishing Activities and Economic Contributions).

Table 4-24
Hunting and Fishing Activities and Economic Contributions

Activity	Participants	Participant Days	Expenditures (Total)	Expenditures (Average per Participant)
Fishing	147,000	1,400,000	\$138,800,000	\$899
Hunting	43,000	748,000	\$204,137,000	\$3,897
Wildlife watchers	643,000	1,619,000	\$682,028,000	\$1,035

Source: USFWS 2011

Note: Includes participation by in-state residents and out-of-state visitors.

While recreation opportunities provided to area residents are important, their expenditures may not represent new money introduced into the economy. If opportunities on BLM-administered lands were not present, it is likely that residents would participate in other local recreation, so this money would still be retained in the local economy.

The impacts of recreation on BLM lands may not be fully captured based on the dollars spent on recreation. Visitors may receive additional “value” from public land recreation. One measure of this value is the amount that consumers would be willing to pay above the actual visitor fees, known as consumer surplus. These costs have been calculated in other regional studies for various activities. Consumer surplus was estimated at \$36 for OHV use, \$173 for biking, \$61 for hiking, \$70 for hunting, and \$13 for primitive camping per day (Rosenberg 2012). The value of recreation could change as visitor experience changes with different management priorities.

Mineral and Energy development, including Renewable Energy

Mining and energy development are historic and current industries in the planning area economy. Use of planning area lands for mining contributes to the local and regional economy through the purchase of goods and services in the local economy by employees and for the physical mining operation. Mining employs local and regional labor, mainly the goods and services sectors supplying the mining operations, and contributes to local and regional income.

Including BMPs or mitigation measures in a project could increase construction or implementation costs for mineral and renewable energy development as well as transmission lines, potentially increasing expenditures at local businesses. In addition, the continued use of project area lands for mining would allow for the continued collection of mineral royalties, a portion of which would be returned to the counties of origin. Reclamation of projects, such as mining, could provide for increased recreation opportunities, and grazing or OHV, in revegetated and recontoured areas.

Should population increase as a result of increases in mineral development, this may result in social impacts on communities, such as increased crime and increased strain on public services. Impacts on public services include the potential for crowded schools and a greater demand for medical care and local law enforcement. Communities would experience increased costs in order to support growth resulting from project activities.

Closing areas to or withdrawing them from mining would directly limit the potential for economic development based on mining. Such restrictions as seasonal use limitations and special stipulations could increase the costs of operations and potentially alter the demand for employment. This could be reflected in a reduction in income, employment, and expenditures. If costs of operations were to increase to the extent that mining would be economically prohibitive, restrictions would decrease mining operations and thereby income, employment, and local expenditures.

Ensuring mineral development operations do not hamper existing public access would allow other uses of public lands to continue and maintain existing socioeconomic benefits.

In addition to increasing the operations costs of commercial activities, closures and restrictions would protect sensitive resources that have nonmarket socioeconomic values. As identified in previous sections, unique geologic features, caves and cave resources, and paleontological resources represent a draw for current and future visitors. These amenities also draw residents who enjoy natural areas or who live in the area for its scenic, cultural, historic, and natural qualities.

Wetlands, riparian areas, and wildlife habitat supports diverse wildlife that could bring in visitors and visitor expenditures to the CCD and secure the existence

of a valued resource for the future. Improving wildlife habitat can improve wildlife watching and hunting, both of which can inject tourist dollars into the local economy. Wetlands provide such nonmarket values as nutrient retention, water filtration, flood control, and erosion protection. Fish habitat supports recreational fisheries, which can bring visitor expenditures into the local economy. Both fish and wildlife habitat protection can improve biodiversity; this can provide nonmarket value to current generations and option and bequest benefits to future generations.

Commercial operations would experience increased costs to comply with VRM management objectives under all alternatives. These increased costs would be associated with such activities as moving, shaping, or painting facilities to blend with the surrounding viewshed. Operational costs would increase based on the designated VRM class in which the commercial operations would occur. VRM management would preserve valued viewsheds that draw recreational visitors, who also generate expenditures, income, and employment in the local economy.

All alternatives would make lands available for disposal to improve the efficiency of managing high resource value lands. This could improve management of the industries that provide income and employment in the planning area and could improve management of sensitive resources with high nonmarket values. Development on these disposed lands could increase the tax base and provide employment and income in the local economy. This could enable local governments to better handle the increasing pressures of population, for public services and facilities, and for recreation. Converting public lands to private may temporarily reduce open land property values.

Renewable energy development would not occur in ROW exclusion areas. This could decrease in the potential for economic growth, based on development of this resource.

The planning area sits atop one of the most active geothermal resources in Nevada and is considered to have a high potential for future geothermal development. The CCD currently manages 148 geothermal leases, 5 associated power plants, and an active geothermal power production of 183 megawatts (MW) (BLM 2013f). While many of the high potential areas have already been developed, it is still foreseeable for the area to develop five 15-MW geothermal power plants over the next 20 years (BLM 2013g).

Geothermal development can be broken down into three generally sequential phases: exploration, development and production, and reclamation and abandonment. The exploration phase includes surveying and drilling temperature gradient wells. Such activities as gradient well drilling and seismic surveys could provide temporary jobs for residents near geothermal resources. Expenditures for fuel, lodging, food, and other needs would provide a stimulus to the local economy. Other land uses would generally not be impacted during the exploration phase; therefore, no long-term economic impact on these uses

would occur. No long-term increases in population would occur in this phase, and demand for schools would not increase. The impacts on socioeconomics during this phase would be low throughout the project area.

Development and production activities usually center around drilling operations, construction, and operations. There would likely be construction employment for installing access roads, pipelines, transmission lines, drill sites, and power plants, though the level would vary depending on the resource potential. The type of employment and number of available jobs would also vary as the construction proceeds. Well and transmission line construction jobs would be temporary. Due to the variation in jobs available at different stages in construction, average employment would vary at any one time.

Expenditures for equipment, materials, fuel, lodging, food, and other needs would stimulate the local economy for the duration. The level of these impacts would vary depending on the size of the project and the socioeconomic conditions of the local community. Some of the secondary impacts would occur in the local communities in which geothermal development occurs, while others would occur at a regional or national level.

Some economic impacts could occur should income and employment associated with ranching, recreation, hunting, mining, or other land use activities be altered by geothermal development. Constructing geothermal facilities would alter the landscape and nonmarket values of the immediate area; however, the extent of impact would vary with each project. In the short term, other land uses and income derived from these uses could be displaced by geothermal development. In the long term, many other land uses could be compatible with geothermal use due to the small footprint of geothermal plants; however, aesthetic values would be permanently altered.

Another possible impact would be to broaden the economic base of the communities within the region of influence of geothermal development. This impact is particularly relevant in rural communities where employment sectors have typically been limited and unemployment rates are high.

The operations phase typically lasts for several decades. During operations, jobs would continue to be available, but they would be fewer than during construction. The operation of power plants may require the in-migration of workers for certain occupational categories. The population growth and need for additional infrastructure in a community would depend on specific projects and communities. However, impacts would generally be less than those seen during the initial construction of the drilling operations phase, where a greater number of workers would be required.

Reclamation activities include abandoning the well after production ceases and reclaiming all disturbed areas. All disturbed lands would be reclaimed in accordance with BLM standards. The closeout phase would likely involve

additional construction jobs for reclaiming disturbed areas. As in other phases, expenditures for equipment, materials, fuel, lodging, food, and other needs would stimulate the local economy. BMPs would be used to minimize dust, noise, and other disturbance next to communities so that potential effects on nonmarket values would be avoided. Reclamation could increase aesthetic values and bring back income to local industry that supports use of that land for recreation and other uses.

Restrictions applied to mining operations, energy development, and commercial recreation could increase operational costs or preclude development to protect WSAs. These increased costs would result in lower incomes for these operations and potential reductions in expenditures within local economies; however, protecting the resources for which the WSAs were designated also would protect their values for visitors and area residents, which could exceed the reduction in incomes and expenditures.

Withdrawal from mineral entry would be petitioned and could occur for portions of ACECs with mineral potential. Under all alternatives, is not likely that the change in population that would result from changes in energy and mineral sector employment would result in a significant overall population change. In addition, the housing vacancy rate in the planning area (18.9 percent average) would likely accommodate any changes in housing demand resulting from population changes due to energy development. However, concentrated development could impact community economy or social structure at the local level. These impacts are based on current conditions and available technology in the energy market. Actual activity in renewable energy or mining sectors cannot be projected, so these estimates may not be an accurate portrayal of actual impacts. In addition, changes in population, housing markets, or other community factors could alter impacts on housing availability and affordability at the local level.

Crushed stone and sand and gravel removal by county and state governments is authorized under free use permits, meaning that the BLM receives no revenues or lease fees. No fees are collected from the removal of salable and locatable minerals; however, royalties from coal and oil and gas production are distributed back to local governments and represent an important BLM-associated income stream in planning area counties. Impracticalities exist in predicting actual levels of production, market prices, and the resulting royalties paid. This makes it difficult to accurately assess the resulting input from these fees into the local economy.

State-wide livestock grazing represents an important economic sector. Direct contributions from BLM-administered lands in 2012 were \$939 million, and total contributions (direct, indirect, and induced) were estimated at \$1.342 billion (BLM 2012j). Locally, agriculture represents approximately one percent of jobs in the planning area counties, based on 2010 numbers (Headwater Economics

2012). These numbers include all agricultural activity, including farming and ranching on private and BLM-administered lands.

BLM-administered land available for livestock grazing represents an important component of the grazing for local ranchers. The level of permitted grazing (as measured by AUMs) affects the number of jobs and level of income related to grazing in the planning area. In addition, should management actions reduce or eliminate grazing, permittees would likely need to locate alternative sources of forage. The cost of replacing BLM-administered lands with private grazing lands can be estimated. In 2012, the average fee per AUM on private lands was \$13.00 in Nevada and \$17.30 in California, as compared with the federal grazing fee of \$1.35 per AUM (BLM 2012j).

The permitted level of AUMs may not be an accurate portrayal of actual impacts. Factors such as drought, financial limitations on operators, market conditions, and the implementation of grazing practices designed to improve range conditions are important to consider. Also, impacts may not be evenly distributed across all portions of the planning area. Should permitted AUMs be reduced in allotments that were not billing at full capacity, then economic impacts associated with that particular allotment and permittee could be minimal.

In addition, management actions that impact the ability of permittees to access allotments, restrict management practices, or change grazing schedules may impact operational costs for permittees. Resting burned areas from livestock grazing would temporarily increase operational costs for ranchers. These costs include finding alternative range to graze or buying hay to feed livestock. Likewise, restrictions on permittees' ability to construct or improve range improvements can limit their ability to effectively distribute livestock and increase operational costs. Economic impacts from these management actions would include changes in tax revenue from livestock sales and in the money spent on supplies.

Public land managed for livestock grazing provides both market values and nonmarket values, including open space and western ranch scenery, which provide value to some residents and outside visitors. In addition, some of the lifestyle value of ranching is likely to be captured in markets (e.g., property values of ranches next to public lands).

Conversion of ranch lands to residential or other uses can impact the economic and social setting of the local area. The sale of these agricultural lands provides financial liquidity to ranchers but it generally results in increased building of fences, houses, and sometimes other structures (e.g., barns), changing the visual landscape. Under all alternatives, this trend would be likely to continue because it is fundamentally related to the nature of the ranching business (profit margins are generally low and can turn negative in drought or other adverse conditions, and for most ranchers, their primary financial asset is the land itself).

Alternatives that could lead to increased costs for area ranchers could serve to increase this trend.

Nonmarket Values

In addition to market values described above, nonmarket values are important to the well-being of visitors, residents, and others outside the planning area. These values include natural amenities, quality-of-life factors (such as view and open space), recreation opportunities, and ecosystem services. Nonmarket values relate to things that people value but are not generally bought or sold in a marketplace. Nonmarket values are difficult to quantify, and insufficient data exists to assess the impacts of management actions. However, the fact that no monetary value is assigned to these values does not lessen their importance in the decision-making process. Some of the value associated with open space and other features can be captured in markets. For example, the price of a house that overlooks a pristine mountain range might be higher than the price of a house identical in almost every respect but overlooking a cement factory. However, the ability to see an open landscape while driving along a highway is not likely to be captured in the market.

Preservation of rare or unique species and habitats can have a value to residents and society as a whole. The value of these species' existence is known as nonuse valuation. While no studies have specifically investigated the nonuse valuation specific to the Greater Sage-Grouse, a literature search conducted by the Forest Service and the BLM, in coordination with the Nevada Greater Sage-Grouse EIS planning, demonstrated a range of total economic value of protecting habitat for similar species at \$14.69 to \$58.49 annually per household (BLM 2013d).

Some changes in management could affect both market and nonmarket values. For example, development that substantially alters the visual characteristics of the landscape might, over time, result in fewer tourists visiting the area and spending money in local hotels, restaurants, and shops. This decline in tourism would result in adverse impacts on employment and income. Such development also could reduce the satisfaction of residents who value open space and, therefore, would result in adverse impacts on nonmarket values. Conversely, new development also would generate jobs and income, and the net effect—if all values were to be expressed in the same metric (dollars)—could be positive or negative.

Setting aside certain areas for protection, such as ACECs and other special management (such as managing areas as VRM Class I) would further maintain and perhaps enhance the nonmarket values associated with natural amenities protected on these lands. In particular, wilderness has been correlated with rapid population, income, and employment growth relative to nonwilderness counties. Services jobs are increasingly mobile, and many entrepreneurs locate their businesses in areas with a high quality of life (Lorah and Southwick 2003).

In addition, wilderness has been linked with increased local property values (Phillips 2004). It appears that other special protection areas, such as ACECs, lands managed to protect wilderness characteristics, and VRM Class I areas, could also attract new residents and tourists to the area. This in turn would contribute to area economic activity. In some cases, land protection directly reduces employment growth; however, it has been shown that natural amenities can offset job losses due to increases in net migration (Eichman et al. 2010). Natural amenities and quality of life have been increasingly recognized as important factors in the economic prospects of many rural communities in the West (Rudzitis and Johnson 2000). In addition, nonlabor income is intimately tied to natural amenities. Rural county population change, the development of rural recreation, and retirement destination areas are all related to natural amenities (McGranahan 1999).

Recently, models have been created to assess the economic benefits of ecosystem services so that these economic values can be incorporated into the planning process. A study based in the Pike San Isabel National Forest of Colorado's Front Range determined the total value of ecosystem services to be \$2,208 per acre per year in 2008 dollars (Bacigalupi 2010).

Ecosystem services benefits vary across specific habitats and with site-specific conditions; due to the complexity and cost of implementing site-specific nonmarket valuation methods, quantifying these values is beyond the scope of this analysis. However, the BLM recognizes that changes in nonmarket values would be likely as a result of management actions, and the severity of impacts would depend on the level of resource protection and development under each alternative. In general, alternatives that emphasize resource development over conservation likely would result in more impacts on nonmarket values and perceived quality of life in the community.

Social and Economic Conditions: Effects from Air Quality Management

Effects Common to All Alternatives

Management actions under all alternatives would require all projects on BLM-administered lands to comply with national, state, and local standards related to air quality, including those for dust abatement and prescribed burns. This would result in operational costs for development but would minimize air pollution, resulting in improvement of nonmarket values, as discussed under *Nature and Type of Effects*.

Effects under Alternative A

Site-specific limitations on surface-disturbing activities would limit soil disturbance and related air pollution in areas with sensitive soils, preserving these areas for future visitor use and related economic input to the local economy.

Effects under Alternatives B, C, D, and E

Specific dust and particulate control measures, as described under project BMPs (**Appendix B**), could increase operations costs for construction, mining, and renewable energy activities compared to Alternative A. However, such actions would minimize air pollution from these sources, improving air quality and nonmarket values, which in conjunction with other benefits, could help ensure continued visitation in the planning area and continued visitor expenditures in the local economy.

Social and Economic Conditions: Effects from Climate Management*Effects Common to All Alternatives*

Climate change could increase the intensity of natural weather patterns and events, such as drought, flooding, and wildfires. Under all alternatives, there may be increased costs for fighting wildfires, managing exotic species, constructing new infrastructure to mitigate flood risks or increase depleted freshwater resources, or restoring sensitive aquatic ecosystems. The costs to respond to these types of changes or events would increase financial stress on local and statewide resources. The costs may be more pronounced in rural areas with smaller tax bases, particularly communities that depend on public land resources for their livelihood, such as ranching communities.

Effects under Alternative A

There are no management actions under Alternative A for climate management, leaving the planning area more vulnerable to impacts that may occur under climate change. While current management practices include management for forests and some exotic species, a lack of preparation for persistent and catastrophic climate events in the future may substantially increase costs for response and relief.

Effects under Alternatives B, C, D, and E

Alternatives B through E would promote planning and management to mitigate the effects of climate change in the future. Putting mitigation in place may help reduce the impacts of persistent and catastrophic climate events in the future, decreasing associated response and relief costs, compared with Alternative A.

Social and Economic Conditions: Effects from Soil Resources*Effects Common to All Alternatives*

Under all alternatives, management actions would incorporate BMPs or other mitigation measures for proposed activities on sensitive soils, with the level of protection varying by alternative.

Effects under Alternative A

Alternative A would continue to reduce soil loss and losses in ground cover, as well as limit OHV use in areas of severe erosion hazard susceptibility. These erosion control measures would have a similar effect on those identified under

Nature and Type of Effects, with projects continuing to be built and adding revenue and jobs to local economies.

Effects under Alternative B

Alternative B would apply more restrictive requirements on surface-disturbing projects as detailed in project BMPs (**Appendix B**). These requirements would add additional costs to surface-disturbing projects compared with Alternative A. If the costs of these requirements were high enough, it could reduce the size or prevent the construction of a project. The decrease in size or abandonment of potential projects could limit or prevent revenue and jobs from contributing to local economies.

Effects under Alternative C

Alternative C would be similar to Alternative B but slightly more restrictive, particularly in areas with biological soil crusts. Impacts would be similar to those identified under Alternative B but would increase restrictions on development in specific areas, with the potential for decreased development, jobs, and income.

Effects under Alternative D

Impacts would be similar to those identified in Alternative B.

Effects under Alternative E

Effects under Alternative E would be the same as those identified for Alternative B.

Social and Economic Conditions: Effects from Water Resources

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would delineate at-risk or critical watersheds for special consideration when developing an activity plan. It also would eliminate OHV use in sensitive water resource areas. These management actions would have limited economic impacts on regional or local economics. However, the lack of specific management for these areas could result in degradation of these aquatic ecosystems or sensitive watersheds, impacting nonmarket values like water clarity and vibrant ecosystems for open space.

Effects under Alternative B

To protect public drinking water, Alternative B would prioritize watersheds that include wellhead protection zones. Managing municipal watersheds as recharge areas would allow for population and development growth in communities that depend on water rights and water supplies. Managing priority watersheds for multiple uses and managing wellhead protection zones as avoidance areas could allow continued use of these areas for grazing, recreation, and minerals

development. This would result in continued revenue to local communities, jobs, and tax revenues associated with ranching. It also would increase local expenditures by recreational visitors and employment and expenditures associated with mining operations.

These effects would be realized only to the extent that these multiple uses occur in priority watersheds and wellhead protection zones. Alternative B also would foster economic growth and development, which would benefit employment and incomes in the planning area and areas outside of the planning area by allowing water importation and exportation projects.

Effects under Alternative C

Alternative C would prioritize watersheds and any associated endangered species habitat by closing areas to mineral development, implementing surface use stipulations, and prohibiting surface-disturbing activities. This would limit the use of these areas for surface-disturbing activities, including recreation, livestock grazing, mineral extractions, and ROWs.

These restrictions could result in diminished revenue to local communities, jobs, and tax revenues associated with ranching, diminished local expenditures by recreational visitors, and diminished employment and expenditures associated with mining, contingent on the extent of the resources that would be affected.

Alternative C would foster economic growth and development by allowing water importation and exportation projects, while sustaining perennial yield. Management for flood and drought protections would also help prevent catastrophic water situations that could adversely affect agriculture and livestock grazing operations. These effects would be realized only to the extent that these multiple uses occur in identified watersheds under this alternative. Management actions would prioritize water use for wildlife and related habitat as well as water quality for residential populations. This could improve the conditions of nonmarket values, like clean water and vibrant ecosystems for open space.

Effects under Alternative D

Alternative D would prioritize watersheds containing municipal water supply within 1,000 feet of municipal well heads. It would accomplish this by restricting areas to mineral development, implementing surface use stipulations, and restricting surface disturbance. Impacts of these restrictions would be as described under Alternative C, but they would be limited to the 1,000-foot radius and therefore would be decreased in intensity.

Effects under Alternative E

Effects under Alternative E would be similar to those under Alternative D.

Social and Economic Conditions: Effects from Vegetation Resources

Effects Common to All Alternatives

Woodlands Management

Under all alternatives, management actions for woodlands likely result in maintenance or improvement of forestry and woodland resources in the long run, benefiting wildlife and the woodland ecosystem, providing opportunities for recreation, wildlife and wild horse and burro viewing, and harvest of products to varying degrees depending on alternative.

Rangeland Management

All alternatives provide for grazing on rangeland, with varying levels of permitted use. The continued availability of rangeland for grazing would maintain ranchers' contributions to the local economy through expenditures on equipment, supplies, and services and employment. In addition, continued grazing would maintain the social environment of the rural population. Implementing mitigation measures and ESR treatments may temporarily close areas to certain uses, such as livestock grazing and recreation, which would have short-term economic impacts.

Riparian and Wetlands Management

Under all alternatives, management actions that preserve the continued health of wetland and riparian areas would continue to provide a nonmarket benefit by continuing to make habitat available for biological diversity and consequent wildlife and wild horse and burro watching, as well as providing ecosystem services, as discussed under *Nature and Type of Effects*.

Invasive Species

Under all alternatives, management actions controlling the spread of noxious weeds would promote land health, including preservation of habitat for native species with potential benefits for visitors interested in wildlife and wild horse and burro viewing and recreation in a natural setting. In addition, control of invasive species would provide for improved forage conditions for livestock grazing with potential for improved livestock health and increased market prices for permittees.

Effects under Alternative A

Forestry and Woodland Management

Alternative A would preserve the stand of white pines for visitors and would provide related economic impacts from visitor spending.

Rangeland Management

Alternative A would emphasize maintenance of rangeland health standards, providing forage for livestock grazing permittees and in the long term supporting economic activity from livestock grazing.

Restoration

Lack of management actions for restoration would limit costs for grazing operations but would not improve land health and related economic benefits in the long term.

Riparian and Wetlands Management

Lack of specific management actions for riparian and wetlands management may degrade habitat in the long term and would not support habitat improvement for visitor, wild horse and burros and wildlife use, and related economic benefits. In addition, degradation of riparian areas in the long term would reduce nonmarket benefits of ecosystem services, as described under *Nature and Type of Effects*.

Invasive Species

Under Alternative A, treatment priority would be based on resources at risk and on reducing economic impacts in these areas first. Lack of specific guidance for other components of the invasive species program in the RMP may result in varying degrees of protection, levels of impact, and related economic effects throughout the planning area.

Effects under Alternative B

Forest and Woodlands

Under Alternative B, thinning of pinyon-juniper woodlands would promote healthy woodlands in the long term, with an emphasis on providing a source of material for personal harvest, commercial use, and biomass. As a result, local community members would have access to an inexpensive fuel wood source and local business would have economic opportunities.

Rangeland Management

Under Alternative B, resting burned areas of rangeland vegetation from grazing for two growing seasons could increase costs to ranchers and reduce income for permittees. This would apply to the extent that these reductions would require permittees to lease additional private land, purchase additional forage, or reduce livestock numbers over the long term. These impacts on ranchers could affect local communities that depend on tax revenue from livestock sales, jobs, and supply purchases. These effects would be short term until burned areas were open again to grazing.

Restoration

Under Alternative B, actions to promote selection of appropriate material may support improvement of restoration treatments, resulting in minimal restrictions and related costs to permittees and other land users, but with potential for improved land health in the long term.

Riparian and Wetlands Management

Alternative B would emphasize achievement of PFC for 75 percent of riparian area. Achieving PFC could increase operational costs and restrict uses. The local economy and social values could be affected if a reduction in the area or type of recreation resulted in a decrease in visitors or in a locally valued recreation type, such as OHV use. If road closures or route relocations inhibited access to minerals and mining, costs to these operations could increase. These costs could be passed along to the local economy in terms of decreased employment or income. In the long term, achieving PFC would support nonmarket benefits of the riparian and wetlands ecosystem, as discussed under *Nature and Type of Effects*.

Invasive Species

Under Alternative B, actions to control weed spread from land use activities, such as ROW development, mineral material extraction, and other surface-disturbing activities, would limit the degradation of native habitats and related market and nonmarket economic costs. Regulations could result in some additional costs to operators.

Effects under Alternative C

Forest and Woodlands

Alternative C would provide the most protective measures for woodland habitat. Measures restricting commercial harvest would limit economic opportunities from woodland products. In addition, measures restricting livestock grazing could increase costs to permittees should livestock relocation or changes in grazing practices be required. However, habitat improvement should benefit woodland habitat in the long term for wildlife and wild horse and burro viewing and recreation.

Rangeland Management

Under Alternative C, the emphasis on restoration of habitat for native species could result in some limitations on resource uses, with economic costs for the local economy. The effects of resting burned areas would be as described under Alternative B; however, the likely increase in exclusion could require permittees to lease additional private land, purchase additional forage, or reduce livestock numbers over the longer resting period.

Restoration

Restoration, including ESR, would promote long-term improvement of land health, which also could improve the health of grazing livestock. Improved livestock health could reduce costs to ranchers for maintaining livestock and could increase their sale price. Restoration, including exclusion of grazing from site-specific areas, would increase operational costs for commercial users to control weeds. These costs could reduce the amount of goods and services

purchased; the level of impact would depend on site-specific ecological conditions.

Riparian and Wetlands Management

Alternative C would have impacts similar to those discussed under Alternative B, but increased limitations on economic activities would be more likely to affect ranching costs, recreation, and mining as a result of higher PFC objectives. This could diminish revenue to local communities and lower tax revenues associated with these operations. However, Alternative C would provide greater protection to riparian and wetlands areas, the preservation of which would benefit society, as described above under *Nature and Type of Effects*.

Invasive Species and Noxious Weeds

Under Alternative C, regulations would be in place to limit weed spread from surface disturbance, with impacts as discussed under Alternative B. An emphasis on public education and use of native species may further increase costs for operators but would also improve habitat in the long term, with related nonmarket benefits, as discussed under *Nature and Type of Effects*.

Effects under Alternative D

Forest and Woodlands

Under Alternative D, forest and woodlands management would allow product extraction for commercial and personal use. As a result, local residents and businesses would have some economic opportunities for harvest, however at a reduced scale compared to Alternative B. As discussed under Alternative C, vegetation treatments may maintain or improve woodland habitat, preserving the ecosystem for human use wildlife and wild horse and burro preservation with nonmarket benefits.

Rangeland

Under Alternative D, impacts would be similar to those described under Alternative B. However, management actions would emphasize the restoration of habitat for native species, assisting with preservation and resulting in nonmarket benefits.

Restoration

Under Alternative D, impacts would be similar to those described under Alternative C.

Riparian and Wetlands

Under Alternative D, impacts would be similar to those described under Alternative C, with a goal of 85 percent PFC. Some level of disturbing activities in riparian areas would be permitted as under Alternative B, reducing the level of impacts on recreation and travel access and related economic activities.

Invasive Species and Noxious Weeds

Under Alternative D, impacts would be similar to those described under Alternative B, with an emphasis on treatments in the urban interface zone. This would result in a difference in costs for operators, depending on the location in the planning area.

Effects under Alternative E

Forest and Woodland

Impacts under Alternative E would be similar to those described under Alternative D.

Rangeland Management

Alternative D impacts would be similar to those described under Alternative B, but exclusion of livestock could be extended past two years for habitat preservation, with increased impacts on costs for livestock permittees and local businesses supporting livestock operations.

Restoration

Impacts would be similar to those described under Alternative C.

Riparian and Wetlands Management

Impacts would be similar to those described under Alternative D.

Invasive Species

Impacts would be similar to those described under Alternative B.

Social and Economic Conditions: Effects from Fish and Wildlife Management

Effects Common to All Alternatives

Protecting fish and wildlife would involve use restrictions and implementation of mitigation measures and BMPs under all alternatives. This could affect the economic contribution of grazing, minerals operations, recreation, or renewable energy development, depending on the alternative, the types of restrictions, and the extent of the restrictions.

Effects under Alternative A

Under Alternative A, managing wildlife habitat to provide big game populations would foster continued economic growth from recreation and hunting.

Effects under Alternative B

Under Alternative B, disturbance of important big game habitat, such as lambing and calving areas and winter range, would be mitigated, improving habitat conditions for wildlife and enhancing hunting and wildlife viewing. Restrictions would, however, also reduce economic activity from surface-disturbing land uses compared to Alternative A. Limitations on development to protect

migratory birds and raptors and related impacts on economic activity would also occur for migratory birds and raptors. Protective measures for bats would limit recreation in some caves, having a minor economic impact.

Effects under Alternative C

Alternative C would be the most protective for wildlife habitat of all alternatives. Restrictions on development and land use would be similar to those described under Alternative B but would include additional limitations on use. Disturbance from land use authorizations would be prohibited in sensitive habitat locations for important wildlife areas.

Preservation of habitat would provide enhanced habitat for fish and wildlife and could result in enhanced opportunities for hunting and fishing, increasing spending for these activities in the local area. However, restrictions on surface disturbance and use under Alternative C would affect the economic output from mineral development, lands, and realty actions. In addition, restrictions on livestock grazing and limitations on domestic sheep grazing would impact economic contributions to the local economy from livestock grazing.

Effects under Alternative D

Under Alternative D, protective measures for sensitive wildlife habitat would emphasize preservation of habitat for wildlife in the urban interface zone, with mitigation of disturbance in other portions of the planning area. As a result, limits on economic activities and opportunities for enhanced hunting and wildlife viewing would be highest in the urban interface.

Effects under Alternative E

Under Alternative E, timing limitations and other restrictions for wildlife protection would be similar to those described under Alternative C, with some exceptions allowed for development. Impacts would be similar to those described under Alternative C.

Social and Economic Conditions: Effects from Special Status Species Management

Effects Common to All Alternatives

All alternatives would impose restrictions to protect special status species, which could inhibit livestock grazing, mining, recreation, and renewable energy development. These restrictions could increase the costs of operations, decrease the incomes of operators, discourage some recreationists, and decrease expenditures within the local economy. Avoiding the listing of species as threatened and endangered by implementing management actions designed to prevent listing would impose fewer restrictions on ranching, mining, recreation, and renewable energy activities, which otherwise could be curtailed to protect threatened and endangered species. Protecting threatened and endangered species also could increase operational costs for these uses. Therefore, avoiding listing would allow for the continued economic contribution of these activities

without the associated costs of additional protection measures. Protecting special status species would also benefit biodiversity, which would provide nonmarket benefits, as described under *Nature and Type of Effects*.

Effects under Alternative A

Under Alternative A, management actions would support reintroduction of Lahontan cutthroat trout, bighorn sheep, and other endemic species into suitable, potential, and historic habit, providing enhanced nonmarket benefits from preservation of these species. Restricting activities that might disturb Greater Sage-Grouse between February 15 and May 15 would result in some limited restrictions on development and an associated reduction in economic activity.

Effects under Alternative B

Under Alternative B, restrictions in place to protect Carson wandering skipper habitat would have minimal impact on economic activities due to the small area excluded from development. Nonmarket benefits of preservation of the species could occur, as discussed under *Nature and Type of Effects*.

Management actions to protect Greater Sage-Grouse would include vegetation treatments to enhance habitat and restrictions on surface-disturbing activities within 0.6 mile of important habitat areas, as well as ROW avoidance and CSU stipulations for PPMAs. Impacts would occur throughout the planning area but would be highest for communities near PPMAs.

As discussed under *Nature and Type of Effects*, such restrictions would impose limitations on mineral, renewable energy, and ROW development. If ROW restrictions discourage energy development, the potential for economic growth based on this industry also could be limited, depending on whether the restrictions would occur in areas of high potential. Due to the unpredictability of energy and mineral development, exact costs of stipulations cannot be determined. Stipulations and other limitations would increase costs for developers; increased costs could reduce earnings and decrease expenditures within the overall economy, affecting economic growth, income, and employment.

Under Alternative B, time of year and time of day restrictions on travel could restrict some recreation in PPMAs. A reduction in visitor use could impact the local economies that depend on visitors and tourists to visit the area and spend money on lodging, food, fuel, and other services.

As discussed under *Nature and Type of Effects*, preservation of the Greater Sage-Grouse has nonmarket values. In addition, implementing management actions that would avoid listing species as threatened and endangered would reduce future costs, as described under *Effects Common to All Alternatives*.

Effects under Alternative C

Under Alternative C, management actions would impose restrictions on development for a large portion of the planning area. Restrictions include prohibiting fluid mineral leasing on 2,081,700 acres and establishing a ROW exclusion area in PPMAs. Impacts would be as described under *Nature and Type of Effects* and under Alternative B, but at an increased scale, with likely impacts on local communities and the region, with level of intensity dependent on the market prices for renewable energy and locatable minerals that would not be developed under this alternative.

Travel restrictions would be of the same nature as described under Alternative B; however, they would include timing limitations on all motorized and mechanized travel. This would increase impacts on recreation and associated economic activity, compared with Alternative A. In addition, livestock grazing would be eliminated in PPMAs and PGMA, with impacts on both individual permittees and local business supplying the ranching industry.

Effects under Alternative D

Impacts under Alternative D would be similar to those described under Alternative B; however, ROW avoidance areas would be extended to PPMA and PGMA (a 42 percent increase in acres). Economic impacts from the restrictions on ROW development would be similarly increased. Mineral development would be limited by NSO stipulation. Impacts would be similar to Alternative B, but with increased restrictions on surface disturbance and development and related increase in intensity of economic impacts.

Effects under Alternative E

Impacts under Alternative E would be similar to those described under Alternative B.

Social and Economic Conditions: Effects from Wild Horse and Burro Management*Effects Common to All Alternatives*

Under all alternatives the management of wild horses and burros would be supported, preserving this social and historical value. Failure to remove horses or burros when herd populations exceed appropriate management levels (AMLs) could result in conflicts with livestock grazing operations near or in wild horse management areas; permittees may need to adjust management, at increased time or costs. Conversely, management of wild horses and burros for AML would reduce conflicts with livestock operations and would lower operational costs for permittees. Similarly, management for AML would reduce conflicts with wildlife, particularly large game, potentially increasing economic impacts from hunting as well as nonmarket values of wildlife viewing. Overall, impacts on the local economy would likely be minimal under all alternatives.

Effects under Alternative A

Maintaining AMLs through removing excess animals and using contraceptives should prevent an increase in conflicts with livestock and wildlife and maintain current operational costs for permittees.

Effects under Alternatives B, C, D, and E

Under Alternatives B through E, HMAs would be evaluated in Rangeland Health Evaluation or Herd Management Area Plans. A carrying capacity analysis would be completed and AMLs could be adjusted based on site-specific conditions and to meet Standards and Guidelines for Rangeland Health. Improving land health and reducing potential conflicts between wild horses and burros and livestock by adjusting AMLs could improve livestock health, potentially lower operations costs, and result in higher livestock sales prices for ranchers. In addition, adjusting AMLs would reduce conflicts with wildlife, increasing market and nonmarket benefits.

Social and Economic Conditions: Effects from Wildland Fire Ecology and Management*Effects Common to All Alternatives*

Under all alternatives, wildland fire management would actively reduce fuels across the CCD, reducing the risk of catastrophic wildland fires. These types of protections could protect public infrastructure and private buildings from wildfire, ensuring continued employment and productivity, reducing public funds spent on fighting wildfires, and producing other indirect economic benefits. If catastrophic wildfires were prevented, this could also allow continued recreation, prevent air quality degradation, and improve nonmarket values across the region.

Effects under Alternative A

Alternative A would allow for rehabilitation activities after a wildland fire. These could stabilize soils, establish hydrologic function, enhance biological integrity, limit the establishment of invasive plants, and reestablish native species. All of these play a role in enhancing natural ecosystems, strengthening nonmarket values, and improving the health of the land, providing long-term economic benefits for ranching, for wildlife habitat for hunting and viewing, and for wild horse and burro habitat viewing. Implementing wildland fire protection plans would protect the economic base of communities.

Effects under Alternatives B, C, D, and E

Alternatives B through E would be the same as Alternative A, with the exception that emergency stabilization and burned area rehabilitation projects would be prioritized, as outlined in **Table 2-1**. Management actions would also include developing wildland prevention education programs. The effects would be the same as those identified under Alternative A.

Social and Economic Conditions: Effects from Cultural Resources Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would manage one ACEC for the protection of cultural resources, would pursue withdrawal of locatable minerals from three cultural and recreation sites, and would promote interpretation and visitation at five locations. These limited management actions would not have a large impact on the regional or local economy. Due to a lack of protection, visitor or commercial use might degrade cultural resources over time, damaging nonmarket values, such as cultural appreciation.

Effects under Alternative B

Alternative B would provide a moderate level of additional protection for cultural resources as compared to Alternative A. This alternative would protect certain sensitive cultural resources, by imposing small ROW avoidance areas, prohibiting surface-disturbing activities and visual intrusion, requiring CSU for fluid minerals, and managing eight ACECs to protect cultural resources. These protections would limit some minerals development and could increase some operations costs. But they would still allow for economic gains in the regional and local communities, including increased expenditures, income, and employment. To a limited extent, interpretive and educational signs would be constructed, potentially attracting more visitors to the area and increasing related spending in local economies. Nonmarket values, such as cultural appreciation, could moderately increase over time due to a moderate protection of cultural resources.

Effects under Alternative C

Alternative C would provide a high level of additional protections for cultural resources compared to Alternative A. This alternative would include large ROW avoidance areas and ROW exclusion areas around sensitive resources, prohibiting surface-disturbing activities and visual intrusion, requiring NSO for fluid minerals, closing areas to mineral material disposal, and managing nine ACECs for the protection of cultural resources. Prohibiting fluid and solid minerals surface occupancy and mineral material disposal to protect cultural resources could limit economic development. This would be based on mineral operations, increased operations costs, and reduced expenditures, income, and employment. Education and interpretation in high cultural site density areas would attract more visitors to the area and would increase related spending in local economies. Nonmarket values, such as cultural appreciation, would increase over time due to the high levels of protection for cultural resources.

Effects under Alternative D

Management actions under Alternative D would be similar to those under Alternative B, except that only six ACECs would be managed for the protection of cultural resources. The effects would be the same as those identified under Alternative B.

Effects under Alternative E

Alternative E would provide a high level of additional protections compared to Alternative A. This alternative would entail the following:

- Require ROW avoidance areas
- Prohibit surface-disturbing activities and visual intrusion
- Require NSO for fluid minerals
- Manage three ACECs for the protection of cultural resources
- Restrict the Virginia City National Historic Landmark District from minerals and wind energy development
- Designate the Wyemaha Archaeological District for the protection of cultural resources

Prohibiting fluid and solid minerals surface occupancy and mineral material disposal to protect cultural resources could result in the following:

- Limit economic development based on mineral operations
- Increase operations costs
- Reduce expenditures, income, and employment in some areas surrounding the Virginia City National Historic District and the Wyemaha Archaeological District

Other areas would still benefit from the economic gains of multiple use areas. Education and interpretation in high cultural site density areas would attract more visitors to the area and increase related spending in local economies. Nonmarket values, such as cultural appreciation, would increase over time due to the high levels of protections for cultural resources and improved visitor experience.

Social and Economic Conditions: Effects from Paleontological Resources Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would manage one ACEC for the protection of paleontological resources and implement a broad management action for the protection and

preservation of paleontological resources. This would have minimal socioeconomic impacts on local communities.

Effects under Alternatives B, C, D, and E

Alternatives B through E would manage one or two ACECs for the protection of paleontological resources and would require mitigation measures to be developed or field inventories to be conducted to protect known and high potential paleontological resources. This may require ground-disturbing project operators to spend more money on conducting inventories and implementing such measures; however, it would most likely translate into increased expenditures in local communities. The economic impacts would be minimal.

Social and Economic Conditions: Effects from Visual Resources Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would manage 706,300 acres as VRM Class III and IV, the most restrictive classes. Compared to the availability of VRM Class I and II lands, the costs to commercial operations would be relatively low and would have minimal socioeconomic impacts on local communities.

Effects under Alternative B

Alternative B would manage 620,900 acres as VRM Class I and II. Operational costs under Alternative B could be slightly higher due to the small increase of these lands compared to Alternative A. However, Alternative B would preserve views over a greater area, which could be more valuable to the public over the long term, including both the local population and visitors to the CCD, than the negative effects of increased commercial operations costs.

Effects under Alternative C

Alternative C would manage 1.7 million acres as VRM Class I and II. Operational costs under Alternative C could be substantially higher compared to Alternative A. This is because more lands would be managed under these classes. Projects conducted in these areas would have more restrictions and would incur higher operation costs. However, Alternative C would preserve views over a greater area, which could be more valuable to the public, including both the local population and visitors to the CCD, than the negative effects of increased commercial operations costs.

Effects under Alternative D

Alternative D would manage 630,500 acres as VRM Class I and II. Effects would be similar to those identified under Alternative B.

Effects under Alternative E

Alternative E would manage 1,077,700 acres as VRM Class I and II. Effects would be similar to but slightly greater than those identified under Alternative B.

Social and Economic Conditions: Effects from Caves and Cave Resources Management

Effects Common to All Alternatives

Implementing law enforcement patrols and mitigation measures to protect caves and cave resources would vary based on site-specific situations. Avoiding caves and cave resources may increase costs to ROW holders, including mining and energy operations. Preservation of this resource would provide nonmarket values such as open space and functioning ecosystems.

Effects under Alternative A

Management actions under Alternative A would have a similar effect on those identified under *Effects Common to All Alternatives*. The costs identified would have a minimal impact on the local economy.

Effects under Alternative B

Alternative B would restrict surface-disturbing activities near Dynamite Cave and Hidden Cave by implementing a 0.25-mile ROW avoidance buffer, closing the area to mineral materials disposals, and applying a CSU for fluid minerals within 500 feet of the caves. This would limit the flexibility of some surface-disturbing activities and could increase operational costs to protect these resources compared with Alternative A. However, since these actions cover a very small area surrounding only these two caves, it is not likely that there would be a significant economic impact.

Alternative B increases education and outreach efforts at these caves, potentially attracting visitors to the area and increasing outside spending in local communities.

Effects under Alternative C

Alternative C would restrict surface-disturbing activities near Dynamite Cave and Hidden Cave by implementing a 0.5-mile ROW exclusion buffer, closing the area to mineral materials disposal and fluid minerals leasing, recommending the area for withdrawal from locatable mineral entry, and restricting motorized travel within 500 feet of the cave. This would prevent or severely limit the flexibility of some surface-disturbing activities and could increase operational costs to protect these resources compared with Alternative A. Depending on the mineral or renewable energy resources in the area, this could have a noticeable impact on energy development in the area. However, Alternative C would provide the greatest area of protection for these caves, which could also provide the maximum realization of the nonmarket values of this resource.

Alternative C also increases education and outreach efforts at these caves, potentially attracting visitors to the area and increasing outside spending in local communities.

Effects under Alternative D

Effects under Alternative D would be the same as those identified under Alternative B.

Effects under Alternative E

Effects under Alternative E would be the same as those identified under Alternative C.

Social and Economic Conditions: Effects from Forestry and Woodland Product Management

Effects Common to All Alternatives

None of the alternatives would have measurable socioeconomic impacts on employment or income because the amount of forest land within the planning area, and the associated economic activity, is relatively small. Under all alternatives some degree of public harvest of woodland products, such as firewood and posts and poles, would be permitted.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Social and Economic Conditions: Effects from Livestock Grazing Management

Effects Common to All Alternatives

Livestock grazing on public lands would continue under all alternatives, ensuring that tax revenues from livestock sales, jobs, income, and ranching-related expenditures in the local economy would continue and that livestock grazing receipts would be returned to counties. In addition, the social setting of the rural ranching lifestyle would be maintained under all alternatives.

Effects under Alternative A

Under Alternative A, the current level of 4,796,600 acres available to grazing and 151,200 acres of permitted AUMS would be retained, preserving the current level of economic input to the local economy. Not providing forage banks would provide no alternative source of forage for permittees impacted by fire or drought. This could increase costs for permittees. Year-round grazing would provide management options for permittees and would reduce operational costs; however, it could contribute to the failure of allotments to meet land health standards and therefore increase long-term management costs. Should allotments fail to meet land health standards, nonmarket values, such as vegetation conditions and forage for wildlife, wild horses, and burros, would be impacted, which indirectly impacts recreation, hunting, and wildlife viewing.

Effects under Alternative B

Alternative B would keep approximately 4,797,200 acres available to livestock grazing and 151,200 permitted AUMS, this would have minimal economic impact on permittees and the local economy. Allowing continuous grazing and fewer restrictions on structural range improvements would limit operational costs for permittees. The potential for prescriptive grazing is not likely to result in substantial economic effects on permittees due to the sporadic timing and limited basis of use. The potential use of vacant allotments as forage banks could decrease costs to permittees in emergency situations compared to Alternative A.

Effects under Alternative C

Alternative C would include an approximate 73 percent decrease in permitted AUMs (40,700) compared to Alternative A and would reduce the acres available grazing to 2,101,300 acres. Additional restrictions on grazing management, including temporary closure of allotments in emergency situations, restrictions on year-round grazing, and discontinuation of grazing in allotments with a decrease in ecological function, may increase operational costs or further reduce AUMs. Reducing levels of permitted grazing would affect individual ranchers, the local economy, and the social values of the local area. Costs to ranchers to provide forage for cattle would increase. This could lower ranchers' incomes because they would have to find other sources of forage, such as purchasing additional hay or grazing land to equal the AUMs required for the livestock currently using public lands. Ranching incomes would be reduced and consequently the purchase of local services and supplies would be reduced.

Although ranchers must hold private grazing lands in order to obtain grazing permits on BLM lands, the loss of federal grazing permits could still affect their incomes and viability, depending on ranch size and the role that ranching plays as a source of income for the individual rancher. Although the reliance of ranchers on forage from federal land grazing can be relatively small when calculated on an acreage or AUM basis, grazing on federal lands can be an important source of forage, based on seasonal needs. Seasonal forage availability

affects the optimal use of other forages and resources when federal AUMs are not available.

Potential reductions in income and net ranch returns can be greater than the direct economic loss from reductions in federal grazing. Reducing public grazing may also increase the rate of agricultural land conversion. As discussed under *Nature and Type of Effects*, a reduction in the level of ranching could affect the social value attached to this way of life. Ranch lands provide a traditional source of income, habitat for wildlife, and open spaces that are valued for wildlife watching and the preservation of naturalness. These characteristics are particularly important when population and development pressures convert agricultural land and reduce open space.

Effects under Alternative D

Alternative D would keep approximately 4,792,600 acres available to livestock grazing (less than 1 percent change from Alternative A) and 150,800 permitted AUMs (less than 1 percent change from Alternative A), with minimal direct impact on the local economy. As discussed under Alternative C, temporary closure of allotments in emergency situations, restrictions on year-round grazing, and discontinuation of grazing in allotments with decreased ecological function could increase operational costs or further reduce AUMs, with some reduction in local tax revenues and expenditures. Under Alternative D, the BLM would not make grazing available in urban areas that are not compatible with grazing; this action could result in disproportionate economic impacts on grazing operations in the urban corridor.

Effects under Alternative E

Impacts under Alternative E would be similar to those discussed under Alternative B, except that periodic review and adjustment would be as described under Alternative D and temporary closure may occur, with impacts as described under Alternatives C and D.

Social and Economic Conditions: Effects from Geology and Mineral Management

Effects Common to All Alternatives

There are no effects common to all alternatives.

Fluid Minerals

According to the Mineral Potential Assessment Report for the CCD, there is low or no potential for commercial development of oil shale, coal, and oil and gas (BLM 2013f). These have not been significant economic drivers in the past and are anticipated to have an insignificant economic impact on the planning area in the future. Geothermal resources, however, are extremely active in the area, creating a booming market in the planning area. Since this is the major driver in regional and local economies, only impacts from geothermal energy management are discussed in this analysis.

Locatable Minerals

Historically, Nevada has been a major producer of gold and silver and still maintains a high potential for development for both minerals. Although gold and silver mining in the planning area has declined despite a rapid rise in commodity prices in recent years, it is likely that additional deposits will be discovered, especially in areas that are difficult to assess because they are buried under basin fill deposits. Furthermore, gold and silver can be important secondary minerals in some areas, contributing significantly to the economic viability of mining, even if they are not the primary target. There is also high potential for copper, iron, lead/zinc, tungsten, gemstones, magnesium compounds, barite, fluor spar, gypsum/anhydrite, carbonate, and diatomite in the planning area (BLM 2013f).

If new mining operations are created, there would be increased economic development on the regional and local levels, including increased direct and indirect employment; increased expenditures at local businesses for materials, services, food, and fuel; increased demand for local services; and an increase in tax revenues to all levels of government.

Mineral Materials (Salable)

Crushed aggregate, sand, and gravel operations are expected to continue to be developed across the planning area. These minerals tend to have a low unit value, limiting their impact on the regional economy. However, permits for these types of resources can be obtained through free use permits (mostly for county or state use) or through purchasing a lease for commercial uses for a nominal fee. Affordable access to mineral materials could contribute to keeping costs down for local and state transportation projects and private commercial projects, indirectly contributing to the availability of jobs, expenditures in local communities, and tax revenues.

Nonenergy Leasable Minerals

According to the mineral potential assessment report for the CCD, there is low or no potential for commercial development of phosphate, natural asphalt, or sulfur. Potash and sodium have a high potential in the planning area, but there are no current mining operations for potash. Twelve areas are developing sodium resources, but sodium is considered a small component of leasable resources (BLM 2013f). Nonenergy leasable minerals have not been significant economic drivers in the past and are anticipated to have an insignificant economic impact on the planning area in the future. As such, they will not be discussed in the analysis below.

Effects under Alternative A

Fluid Minerals

Alternative A would close 839,100 acres to geothermal leasing. Most of the viable geothermal resources have been developed already, leaving only a few left

that are economically viable. These closures would not affect the remaining viable areas.

Locatable Minerals

Alternative A would maintain the withdrawal of 194,900 acres of federal mineral estate from locatable mineral entry. Alternative A would also replace pre-FLPMA Classification and Multiple Use Act segregations with FLPMA withdrawals which would result in withdrawing 3,700 acres of currently segregated lands from locatable mineral entry. If viable deposits were found under these lands, these restrictions could limit economic development on the regional and local levels.

Mineral Materials (Salable)

Alternative A would close 564,200 acres to mineral material disposal. This could limit the potential for economic benefit and development based on mineral materials, as well as the availability to governmental and commercial projects.

Effects under Alternative B

Fluid Minerals

Alternative B would close 768,500 acres (approximately 8 percent less than Alternative A) to geothermal leasing and apply NSO stipulations to 404,600 acres. As discussed under Alternative A, most of the viable geothermal resources have been developed already, leaving only a few left economically viable resources. These closures would not affect the remaining viable areas. If NSO stipulations applied under Alternative B prohibitively increase costs of development, economic contributions to the local economy from development of geothermal resources, such as employment opportunities, increased expenditures, and revenues from taxes and federal mineral royalties could decrease.

Locatable Minerals

Alternative B would close 187,100 acres to mineral entry and pursue withdrawal of locatable minerals from 439,600 acres. Effects would be similar in nature to those identified under Alternative A. However, since more acres would be pursued for withdrawal, the effects would be greater.

Mineral Materials (Salable)

Alternative B would close 807,200 acres to mineral material disposal. The effects would be the same as those identified under Alternative A.

Effects under Alternative C

Fluid Minerals

Alternative C would close 2,081,700 acres to geothermal leasing and would apply NSO stipulations to 1,039,200 acres. If the additional areas closed were within the remaining viable geothermal energy areas, then it could limit or

prevent the development of a project. This would prevent important economic contributions to local economies, including employment opportunities, increased expenditures in local communities, and increased tax and federal mineral royalties revenues.

Locatable Minerals

Alternative C would propose for the withdrawal of 117,500 acres from locatable mineral entry, which is more than Alternative A.

Mineral Materials (Salable)

Alternative C would close 3,004,800 acres to mineral material disposal (81 percent more acres closed than under Alternative A). This could severely limit the potential for economic development based on mineral materials, as well as their availability to governmental and commercial projects. If nearby sources of mineral material are not available, the cost of some transportation projects may increase, increasing the amount of economic contribution from the local communities. If costs become too prohibitive, projects could be abandoned and all potential economic gains lost.

Effects under Alternative D

Fluid Minerals

Alternative D would close 737,000 acres to geothermal leasing (approximately 12 percent less than Alternative A) and would apply NSO stipulations to 864,800 acres. The effects would be the same as those identified under Alternative B, but potential for impacts would be increased due to increased acres with NSO stipulations applied.

Locatable Minerals

Alternative D would close 187,100 acres to mineral entry and pursue withdrawal of locatable minerals from 440,800 acres. These effects would be similar to Alternative B.

Mineral Materials (Salable)

Alternative D would close 807,700 acres to mineral material disposal. Effects on local construction and transportation projects would be similar to those identified under Alternative C but at decreased magnitude.

Effects under Alternative E

Fluid Minerals

Alternative E would close 1,007,200 acres to geothermal leasing (an approximate 20 percent increase over Alternative A) and would apply NSO stipulations to 1,151,600. The effects would be similar in nature to those identified under Alternative B but potential for impacts would be increased due to increased acres closed and acres with NSO stipulations applied.

Locatable Minerals

Alternative E would close 187,100 acres to mineral entry and would pursue withdrawal of locatable minerals from 470,600 acres. The effects would be the same as those identified under Alternative C but greater due to the increased acreage withdrawn.

Mineral Materials (Salable)

Alternative E would close 1,778,700 acres to mineral material disposal. Effects would be similar to those identified under Alternative A but to a greater degree.

Social and Economic Conditions: Effects from Recreation and Visitor Services

Effects Common to All Alternatives

Under all of the alternatives, recreation visits and permitted activities are expected to increase as local population increases. Employment and income related to recreation, much of which depends on access to BLM-administered lands, would, at a minimum, continue to support communities' quality of life. Changes in recreation levels and activity types could occur as a result of planning actions; however, the role of recreation management and the associated direct and indirect impacts would continue to sustain opportunities important to the area economy and wellbeing under all of the alternatives. All alternatives would provide education and public outreach, which could reinforce social values by improving visitors' connection with CCD lands.

In addition, all alternatives provide for multiple types of dispersed recreation, which would allow for continued inflow of recreation- and tourism-based revenues in the local economy. Such revenues would be derived from expenditures on lodging, dining, recreation equipment, equipment repairs, fuel, and supplies. Differences among alternatives would result primarily from changes in the mix of uses and the acreage available for these uses. For example, restrictions on motorized or mechanized use could reduce expenditures in the local economies by these user groups in the short term; however, expenditures by other user groups could increase as a result.

Effects under Alternative A

Alternative A manages two SRMAs targeting day use and overnight camping containing 67,700 acres and no ERMAs. This would appeal to the portion of visitors who value a more developed recreation experience, but it would offer limited spaces for those kinds of experiences. A diminished visitor experience may prevent repeat visitors and could have a reduced economic impact on local communities and businesses. The lack of ERMAs could also provide a diminished recreation experience and impact nonmarket values of recreation. While backcountry recreationists may visit areas that are outside of RMAs, the experiences could be lacking due to resource conflicts in these areas, potentially

reducing repeat visitors, decreasing the social value of the experience, and preventing visitor spending in local communities.

Under Alternative A, the continued development of motocross tracks and facilities in Lemmon Valley would allow for continued visitation by motorized recreationists. This area is used for motocross recreation and formal races, which are important recreational and social values of the local OHV community, and also provides increased economic activity from the purchase of SRPs or race-day entry fees, fuel, and related equipment.

Effects under Alternative B

Alternative B would have six SRMAs, with two focusing on camping and nonmotorized use and four focusing on OHV and camping use containing 76,100 acres. This would appeal to visitors to CCD lands who are part of the targeted market for each SRMA. Alternative B would enhance recreation in the planning area by providing experience-based opportunities in SRMAs, increasing the number of visitors to the CCD, which would increase expenditures in the local economy. Under Alternative B, the fees collected at the Sand Mountain SRMA would be eliminated, which totaled about \$153,000 in 2013 (**Table 3-29**). This reduced funding could have a significant adverse impact on the management, maintenance, solid waste collections, sewage disposal from vault toilets, and enforcement of the SRMA regulations and supplemental rules.

Alternative B would also have eight ERMAs focusing on a mix of backcountry, dispersed, motorized, and nonmotorized uses containing 1,678,300 acres. This would appeal to those who appreciate lower levels of management in their recreation decisions. While the ERMAs would have less of an economic impact than the SRMAs, they would still contribute to the local economy and fulfill the social values of backcountry recreationists, increasing nonmarket values of recreation for those seeking primitive/backcountry experiences.

Under Alternative B, the tracks and facilities at the Lemmon Valley Motocross Area would continue to be operated by the BLM, while the BLM seeks a lessee to operate and maintain the area. While under the management of the BLM, the area would be used for general, commercial, and competitive motorized sports. This would provide increased economic activity from the purchase of SRPs or race-day entry fees, fuel, and related equipment in the local economy. Depending on the management direction of the new lease, visitor experience could be improved or diminished, causing visitor spending in the area to increase or decrease.

Effects under Alternative C

Under Alternative C, there would be three SRMAs, two focusing on camping and nonmotorized use and one focusing on OHV use containing 74,700 acres and 15 ERMAs focusing on a mix of backcountry, dispersed, motorized, and nonmotorized uses, containing 1.52 million acres.

This alternative would have a lot of land devoted to ERMA, which would appeal to visitors to CCD lands who appreciate lower levels of management in their recreation decisions and would increase nonmarket recreation values for those visitors. However, the moderate amount of SRMA would make Alternative C less likely to generate economic growth from recreation enhancement, as described under Alternative B. In addition, under Alternative C, management actions for Walker Lake SRMA and all individual ERMA other than Dry Valley and Pah Rah would prohibit SRPs for competitive events, not allow SRPs for motorized activities, or entirely prohibit SRPs. This may reduce the economic impact from those activities in the local communities.

Under Alternative C, the motocross tracks at Lemmon Valley Motocross Area would be removed and rehabilitated. The closure of this facility would allow for greater rehabilitation of and access to open spaces, but it would decrease the economic benefit from the purchase of SRPs or race-day entry fees, fuel, and related equipment. The loss of the motocross area could also impact the recreational and social values of the local OHV community.

Effects under Alternative D

Alternative D would have four SRMA, (totaling 67,100 acres) one of which is focused on camping and nonmotorized use and two that are focused on camping and OHV use. It also would have six ERMA focusing on a mix of backcountry, dispersed, motorized, and nonmotorized uses on 292,600 acres. The effects would be similar to those identified under Alternative C, with the potential for moderate economic growth, as described under Alternative B.

Under Alternative D for the Lemmon Valley Motocross facility, effects would be similar to those identified under Alternative B, except that the lease would be pursued with a county or city entity. This could allow for greater continuity in the management of the area over the long term and a sustained economic and social contribution.

Effects under Alternative E

Alternative E would have six SRMA, two focusing on camping and nonmotorized use and four focusing on camping and OHV use, for a total of 106,100 acres. It also calls for 15 ERMA, focusing on a mix of backcountry, dispersed, motorized, and nonmotorized uses on 2.08 million acres, the greatest acreage devoted to such management. These areas would appeal to a wide array of visitors who recreate on CCD lands, creating significant opportunities to generate economic growth. Enhancing recreation in the planning area by providing experience-based opportunities in SRMA and ERMA could increase the number of visitors to the CCD, which would increase expenditures in the local economy, increasing income and encouraging the expansion of local business.

Under Alternative E for the Lemmon Valley Motocross facility, effects would be the same as those identified under Alternative D.

Social and Economic Conditions: Effects from Comprehensive Travel and Transportation Management

Effects Common to All Alternatives

Current planning does not include route designation in areas limited to designated routes, so the exact impacts on motorized and mechanized use levels are difficult to predict and are discussed at a qualitative level.

BLM-administered lands would be managed to meet the travel and transportation needs of people engaged in administrative, commercial, agricultural, casual, traditional, and recreational programs in the planning area. Future site-specific travel management planning will consider impacts on level of use and quality of life resulting from changes in access.

Effects under Alternative A

Alternative A would have 38,700 acres closed to motorized travel, 3.84 million acres open to cross-country travel, and 924,300 acres limited to existing or designated routes. Most OHV travel is managed as open under Alternative A, which would provide the greatest area of use for OHV enthusiasts. OHV recreation accounted for 34.2 percent of all activities on CCD lands in 2013 (**Table 3-48**), with almost 300,000 visitor days in 2013 (**Table 3-31**). Hunters use OHV travel to access favorite hunting areas and game, accounting for 8.1 percent of all activities in the planning area and over 70,000 visitor days in 2013. Having more areas open to motorized vehicles would promote OHV use and encourage expenditures by this recreation group and by hunters. These expenditures generate direct and indirect income to local proprietors and residents.

However, the level of open OHV recreation could be limiting the amount of more primitive nonmotorized recreation in the planning area. This group (including such uses as backpacking, camping, picnicking, fishing, environmental education, bicycling, hiking, and winter activities) contributed 54.6 percent of expenditures to the local economy (**Table 3-48**).

Effects under Alternative B

Alternative B would have 34,700 acres closed to motorized travel (six percent reduction from Alternative A), 95,300 acres open to unrestricted travel (97.5 percent reduction from Alternative A), mainly in RMAs or playas, and 4.68 million acres limited to existing or designated routes (400 percent increase over Alternative A). The effects of increasing limits on travel would be similar to that described under Alternative A, but it would be magnified in intensity due to the increase in restrictions.

Effects under Alternative C

Alternative C would have 1.79 million acres closed to motorized travel (over 470 percent increase from Alternative A), 1,300 acres open to unrestricted travel (99.9 percent reduction from Alternative A), and 3.01 million acres

limited to existing or designated routes (225 percent increase from Alternative A). This alternative would provide for the greatest reduction in open designation of all the alternatives. Restrictions on motorized travel could have a significant effect on motorized vehicle use in the planning area, limiting the areas where users can recreate and discourage expenditures in surrounding areas. However, nonmotorized recreationists may increase their use of these lands and their expenditures in local communities. It may also increase nonmarket values, such as solitude, quiet recreation, and improved air quality.

Effects under Alternative D

Alternative D would have 32,200 acres closed to motorized travel (14 percent reduction from Alternative A), 22,700 acres open to unrestricted travel (99 percent reduction from Alternative A), mainly in RMAs or playas, and 4.75 million acres limited to existing or designated routes. This alternative would provide for the highest amount of motorized travel limited to designated or existing routes. While motorized use would be permitted, restrictions on routes would reduce the expenditures for those interested in open area riding.

Effects under Alternative E

Alternative E would have 30,300 acres closed to motorized travel (18 percent reduction from Alternative A), 55,700 acres open to unrestricted travel (99 percent reduction from Alternative A), mainly in RMAs or playas, and 4.72 million acres limited to existing or designated routes. Effects would be similar to those identified under Alternative D.

Social and Economic Conditions: Effects from Lands and Realty

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A identifies 179,700 acres as suitable for disposal. Development of this land would increase its assessed value, could generate economic growth, and could increase tax revenues to the county. However, a decrease in the amount of public lands could reduce areas available for recreation, and as open space, impacting both market and nonmarket-related benefits of public land use. Under Alternative A, 564,100 acres would be managed as ROW exclusion areas, potentially limiting minerals and energy development in these areas and any associated economic growth.

Effects under Alternative B

Alternative B identifies 273,500 acres as suitable for disposal, 580,000 acres for ROW exclusion, and 1,195,800 acres for ROW avoidance. Effects would be similar to those identified in Alternative A. There is greater potential for increased economic benefit for local communities, as more lands suitable for development could be sold, developed, and taxed. There is also greater potential that projects would need to be moved, limited, or abandoned due to

the increased acres of ROW stipulations, reducing economic inputs to local communities and the regional economy.

Effects under Alternative C

Alternative C identifies no acres suitable for disposal, 2,675,800 acres as ROW exclusion areas, and 369,300 acres as ROW avoidance areas. There would be almost no potential for economic benefit to local communities, as no acres are identified as suitable for disposal. Therefore, no land can be developed, and there would be no associated contribution to the local communities. There is also a greater potential that projects would need to be moved, limited, or abandoned due to the increased acres of ROW stipulations, further reducing economic input to local communities and the regional economy. However, these limitations on development could increase ecosystem function, such as migration corridors for wildlife, increasing the contribution of nonmarket values to the area.

Effects under Alternative D

Alternative D identifies 332,500 acres suitable for disposal, 564,100 acres as ROW exclusion areas, and 1,226,100 acres as ROW avoidance areas. Effects would be similar to those identified under Alternative B.

Effects under Alternative E

Management actions under Alternative E identify 267,200 acres suitable for disposal, 605,900 acres as ROW exclusion areas, and 1,448,200 acres as ROW avoidance areas. Effects would be similar to those identified under Alternative B.

Social and Economic Conditions: Effects from Renewable Energy

Effects Common to All Alternatives

Under all alternatives, economic impacts from solar, wind, and biomass renewable energy sources would continue to be a small part of the regional economy. Since 2003, there have been very few applications for renewable energy projects that completed the exploration and planning phases and went on to be constructed (or are slated for construction). If a utility-scale renewable energy project were to be developed in the planning area, it would bring in temporary construction jobs, permanent operations jobs, expenditures to local business, and increased tax revenues. These types of projects would have a stronger impact on smaller communities in more remote areas, where full-time work opportunities and outside income sources may be difficult to find, than on more developed areas, where job opportunities and economic resources are available from a variety of industries.

According to the reasonably foreseeable development scenario for solar, wind and biomass, it is foreseeable that two utility-scale photo-voltaic solar power plants and two utility-scale wind development projects could be permitted within the next 20 years within the planning area (BLM 2013e). While the solar variance acreage varies between the alternatives, the variances are not expected

to prevent the construction of a solar energy project; instead, they would only impact the location of development.

While ROW exclusion areas included in Alternatives B through E could require more mitigation measures to be put in place than compared to Alternative A, more strict environmental requirements, such as funding and sensitive species habitat, would remain the largest determining factor for the development of wind projects. These requirements would need to be met under all alternatives. It is also foreseeable that two small mobile biomass utilization devices could be developed in the planning area. These would be mobile operations and would most likely tie directly into the grid at fuels treatment sites to offset transportation costs for those projects, which would likely have little impact on regional and local economies.

For effects from geothermal energy development, see *Effects from Geology and Mineral Management*.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Social and Economic Conditions: Effects from Areas of Critical Environmental Concern

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would manage 21,800 acres as ACECs. This would have a minimal impact on the minerals and energy development in the area, and it is likely there would be minimal socioeconomic impacts.

Effects under Alternative B

Alternative B would manage 371,170 acres as ACECs. This could have a much greater impact on the minerals and energy development in the area than Alternative A, as development may be limited in these areas. Level of impacts

would vary by ACEC, depending on whether any of the desired resources are located in these ACECs and the stipulations associated with the individual ACECs and the site-specific stipulations associated with each ACEC. Local economies could be affected due to reduced expenditures and employment, which could be offset by the protection of the sensitive resources and their associated value to society that are associated with these ACECs.

Effects under Alternative C

Alternative C would manage 786,270 acres as ACECs. This would have a much greater impact on the minerals and energy development in the area than Alternative A, with an increased likelihood that desired mineral resources are contained within or under these ACECs.

Increased operational costs could occur to mineral and energy development to develop mitigation measures. Fluid, salable, and solid mineral and energy development would be precluded because ACECs also are defined as exclusion areas. Increased operational costs could occur to mineral and energy development to develop mitigation measures where some development was permitted. Minimal economic contributions from mineral and energy development would be realized within ACECs under Alternative C. Local economies could be affected due to reduced expenditures and employment, which could be offset by the protection of the sensitive resources and their associated value to society that are associated with these ACECs.

Effects under Alternative D

Alternative D would manage 180,000 acres as ACECs. Effects would be similar to those identified under Alternative B.

Effects under Alternative E

Alternative E would manage 82,770 acres as ACECs. Effects would be similar to those identified under Alternative B.

Social and Economic Conditions: Effects from Back Country Byways

Effects Common to All Alternatives

Back Country Byways would stimulate vehicle travel and backcountry tourism, which would promote the purchase of goods and services by these travelers, benefiting local economies. These effects would increase over time as more retirees visit areas via vehicles.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Social and Economic Conditions: Effects from National Trails

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would provide for multiple uses for most areas surrounding national trails and would have a minimal economic effect.

Effects under Alternative B

Management actions for Alternative B would open national trail corridors to mineral material sales and disposals, allowing for continued economic contribution from this industry to the local economy.

Effects under Alternative C

Management actions for Alternative C would close national trail corridors to fluid and nonenergy leasing and mineral material disposals, increasing costs, decreasing earnings for individual mineral and energy development operations, and reducing local expenditures and employment.

Effects under Alternative D

Effects under Alternative D would be the same as those identified under Alternative B.

Effects under Alternative E

Alternative E would close only certain sites and segments of national trails to fluid and nonenergy leasing and mineral material disposals, leaving areas open for continued mineral and energy development. Effects would be similar to Alternative B.

Social and Economic Conditions: Effects from Wild and Scenic Rivers

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Alternative A would manage three NWSRS-eligible segments according to interim protective measures. This would prohibit development and such uses as

mineral and energy development and ROWs along these segments to protect Outstandingly Remarkable Values, as outlined in Section I (b) of the Wild and Scenic Rivers Act.

Implementation of mitigation measures could increase operational expenses, which could reduce local expenditures and other economic benefits; however, protecting these segments of the East Fork of the Carson River would preserve fish habitat, which could benefit fisheries in and downstream of the protected area and scenic recreation values. Improved fisheries could bring in greater fishing visitation, and improved scenic values would benefit and potentially increase use by visitors who enjoy nature-related tourism.

Effects under Alternative B

Alternative B would release three NWSRS-eligible segments from interim protective measures. This would open up these areas to economic development but would fail to protect the nonmarket values described in Alternative A.

Effects under Alternatives C, D, and E

Effects under Alternatives C through E would be the same as those identified under Alternative A.

Social and Economic Conditions: Effects from Wilderness Study Areas

Effects Common to All Alternatives

Based on BLM Manual #6330 Management of Wilderness Study Areas (BLM 2012e) and 3802 regulations, mining operations would incur increased expenses for permits to operate within VSAs to meet the minimal impact criteria. Mining would be limited to claims and leases subject to valid existing rights or grandfathered uses and no new mining or claims would be authorized. Other uses such as energy development could be precluded from development within VSAs. Restrictions also could apply to commercial recreation use since minimum tool restrictions would apply. These impacts would vary based on the nature and scope of required restrictions and mitigation measures. Local economies could be affected due to reduced expenditures and employment.

Effects under Alternative A

Alternative A would result in no unique impacts.

Effects under Alternative B

Alternative B would result in no unique impacts.

Effects under Alternative C

Alternative C would result in no unique impacts.

Effects under Alternative D

Alternative D would result in no unique impacts.

Effects under Alternative E

Alternative E would result in no unique impacts.

Social and Economic Conditions: Effects from Tribal Interests

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

There are very few management actions under Alternative A, potentially leaving sensitive religious and cultural tribal properties, places, and objects vulnerable to damage or destruction from recreation or energy and minerals development.

Effects under Alternatives B, C, D, and E

Management actions under Alternatives B through E would provide greater protections than under Alternative A. These include closing areas in the vicinity of known human burial sites to mineral material disposal, fluid mineral leasing, and nonenergy solid mineral leasing. While this could prevent some mineral development in these areas, the impact on the economy would be minimal. The added protections these alternatives provide would greatly enhance the nonmarket values of the local tribes, including the protection of sensitive religious and cultural tribal properties, places, and objects.

Social and Economic Conditions: Effects from Public Health and Safety

Effects Common to All Alternatives

Under all alternatives, management actions would result in the following:

- Minimize potential hazards to public health and safety from hazardous materials, solid waste sites, and illegal dump sites, resulting from visitor use or authorized activities
- Remove or addresses physical hazards that may cause death or major injury
- Provide public information on hazards in the areas, such as scalding hot pools or abandoned mine shafts

Emphasis on public safety would reduce visitor accidents and contribute to visitors continuing to use public lands to recreate and contributing money to the local economy. Requirements for fencing, signing, and other actions to protect public safety could increase the costs of minerals operations and renewable energy development. These effects on local economies from public health and safety management would be minimal.

Effects under Alternative A

The effects under Alternative A would be similar to those identified in *Effects Common to All Alternatives*.

Effects under Alternatives B, C, D, and E

The effects under Alternatives B through E would be similar to those identified in *Effects Common to All Alternatives*, with the addition of protecting the public from unexploded ordnance, but would be greater in magnitude.

Social and Economic Conditions: Effects from Interpretation and Environmental Education

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

There are no management actions under Alternative A for interpretation and environmental education. Continuing the current programs in place would increase public awareness of the environment and opportunities available on BLM-administered lands. This could attract more tourists to the area and increase spending in local communities. Environmental awareness and conservation techniques taught as part of the outreach programs would help preserve the environment in the planning area, enhancing and protecting nonmarket values such as open space and ecosystem services.

Effects under Alternatives B, C, D, and E

Alternatives B through E would continue current outreach programs and provide additional interpretive and educational programs on BLM-administered lands, potentially attracting more tourism and increasing the preservation of the environment. Effects would be similar to those identified under Alternative A, but greater in magnitude.

4.6.5 Environmental Justice

This section discusses impacts on environmental justice from proposed management actions of other resources and resource uses. Existing conditions are described in **Section 3.4.4, Environmental Justice**.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires that federal agencies identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. Guidance for evaluating environmental justice issues in land use planning is included in BLM Handbook 1601-1, Land Use Planning, Appendix D (BLM 2005a).

Environmental justice refers to the fair treatment and meaningful involvement of people of all races, cultures, and incomes with respect to the development, implementation, and enforcement of environmental laws, regulations, programs, and policies. It focuses on environmental hazards and human health to avoid disproportionately high and adverse human health or environmental effects on minority and low-income populations. Low-income populations are defined as

persons living below the poverty level based on total income of \$11,136 for an individual and \$22,314 for a family household of four for 2010, based on preliminary census data (US Census Bureau 2010a). Black/African American, Hispanic, Asian and Pacific Islander, American Indian, Eskimo, Aleut, and other non-White persons are defined as minority populations.

Summary

Counties within the planning area were examined for minority or low-income populations based on CEQ guidelines (20 percentage points higher than the state average, or more or 50 percent of the total population). Based on the levels defined above, and the data provided in Chapter 3, no counties within the planning area meet the definition of environmental justice populations. Individual populations may contain low-income or minority populations, including the six Native American reservations within the planning area.

Public involvement activities have included outreach in various formats (including local media, internet, and newsletters). Public meetings have been held through the planning area, including in locations accessible by public transportation to facilitate participation for all socioeconomic groups. The BLM would continue to consider environmental justice impacts for all site-specific actions.

As a result, there would be no impacts on environmental justice populations by actions in the RMP under any of the alternatives.

4.6.6 Facilities and Transportation Maintenance

As stated in **Section 3.5.6**, the BLM's transportation system and facilities are critical to its management of public lands. The maintained roads provide access that supports uses ranging from recreation to commercial activity, while facilities provide the infrastructure that supports these activities. There are no specific goals, objectives, or actions outlined for Facilities and Transportation Maintenance in Chapter 2. These activities are specified within the planning area Transportation Plan, which is updated quarterly, and conducted in accordance with BLM 9100 Series Manuals.

Impacts on facilities and transportation management are largely a result of the desired management of other uses and resource programs. These effects are analyzed in the appropriate resource section (e.g., recreation, CTTM). In addition, **Section 4.4.5**, Comprehensive Travel and Transportation Management, includes an assessment of management actions that would limit the BLM's ability to maintain or enhance the travel network as a whole. Therefore, only those impacts resulting from actions that affect facilities development and maintenance or that limit the BLM's ability to maintain existing roads within the planning area are discussed in this section.

Summary

Impacts on facilities and transportation maintenance are the result of changes to the amount of new facility development or construction and the ability to maintain existing facilities and roads. Management that calls for additional facilities would have an impact as well as management that restricts travel or other types of disturbance. In general, management under Alternatives A, B, D, and E includes fewer closures for motorized travel and fewer restrictions on facilities development.

Alternative C would affect facilities and transportation maintenance the least in terms of the amount of maintenance. This is because the largest portion of the planning area would be closed to motorized travel, and there would be restrictions on road and facility development; however, Alternative C would also result in the most restrictions on road and facility development and could have impacts on the ability to conduct maintenance. Alternative B would result in the most impacts on facilities and transportation maintenance in terms of the amount of facilities developed and the level of maintenance that would be required.

Methods of Analysis

Methods and Assumptions

The following methods and assumptions were used to assess the impacts on facilities and transportation maintenance:

- The nature and types of potential impacts on facilities and transportation maintenance from proposed actions under each alternative are based on
 - numerical data gathered during the planning process
 - BLM interdisciplinary team knowledge of the resource
 - input provided during the public scoping process
- Where possible, this analysis uses quantitative data to describe impacts on facilities and transportation maintenance from other resources and resource use programs. Qualitative information is also used to support quantitatively based analysis or where numerical data does not exist. In all cases, best professional judgment is used in evaluating effects on the facilities and transportation maintenance program.
- A travel management plan, which would include specific route designations, will be developed as part of a subsequent implementation-level planning process and is not included as part of this RMP/EIS.
- Implementation of a travel management plan would include increased maintenance and signing.

- This RMP/EIS identifies allocations for open, closed, and limited areas for travel management, within the Comprehensive Travel and Transportation Management section.

Indicators

The following indicators were used to assess impacts on facilities and transportation maintenance:

- Management activities or closures that would restrict facilities development or maintenance
- Management actions that would limit the BLM's ability to maintain or enhance the travel network

Nature and Type of Effects

Impacts on facilities and transportation maintenance are those that restrict or increase facilities development or maintenance. For example, where roads are closed and access is limited, this would restrict the ease of access for maintenance as well. At the same time, however, road closures would result in fewer miles of BLM roads to be maintained.

Implementing management for most of the resources and resource uses would have negligible or no influence on facilities and transportation maintenance actions and are therefore not discussed in detail. The resource uses that would have impacts on facilities and transportation maintenance include CTTM and recreation, lands and realty, and Back Country Byways. Impacts on facilities and transportation maintenance from CTTM are addressed in the CTTM, **Section 4.4.5**.

Facilities and Transportation Maintenance: Effects from Recreation and Visitor Services

Effects Common to All Alternatives

Under all alternatives, the BLM would seek to acquire easements to provide access to BLM-administered lands to meet recreation objectives. These easements would expand and improve the travel network, while reducing barriers to access.

Effects under Alternative A

Alternative A specifies the construction and maintenance of several access roads and the development of a motocross area. One recreational facility and parking area would also be constructed. Expansion of the trail network as discussed (**Section 3.3.5**, Comprehensive Travel and Transportation Management, and **Section 3.3.4**, Recreation and Visitor Services) would increase the road maintenance requirements, while maintaining the road network and access in those areas.

Effects under Alternative B

Under Alternative B, staging areas, parking areas, and primitive camping areas would be designated or constructed, and river access roads would be constructed. This would have greater impacts on facilities and transportation maintenance than under Alternative A.

Effects under Alternative C

Under Alternative C, one recreational camping and parking area would be constructed, and one mile of access road would be maintained; therefore, there would be fewer impacts on facilities and transportation maintenance than all of the alternatives.

Effects under Alternatives D and E

Under Alternatives D and E, the highest number of access roads into recreation areas would be maintained, and camping, parking, and staging areas would be developed, within the Hungry Valley SRMA. This would have the greatest impacts on facilities and transportation maintenance of all the alternatives.

Facilities and Transportation Maintenance: Effects from Lands and Realty

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Management under Alternative A that prioritizes access to the Pah Rah Range, Petersen Mountains, and the Jumbo area, while maintaining or increasing access to other BLM-administered lands, would impact facilities and transportation maintenance by improving overall access. However, it would also result in additional maintenance.

Effects under Alternative B

Alternative B would identify 84,500 additional acres for disposal than Alternative A; 580,000 acres would be managed as ROW exclusion areas; and 1,195,800 acres would be managed as ROW avoidance areas. Impacts associated with reductions in access and road miles to be maintained from land disposal and ROW restrictions would be consistent with the description under *Nature and Types of Effects*.

Effects under Alternative C

Alternative C would have the least potential for impacts from land tenure actions because there would not be any areas identified for disposal. However, restrictions on future ROW development would be greatest under Alternative C, which would manage 2,675,800 acres as ROW exclusion areas and 369,300 acres as ROW avoidance areas. Impacts associated with reductions in access and miles of roads to be maintained from ROW restrictions would be consistent with those described under *Nature and Types of Effects*.

Effects under Alternative D

Land tenure actions under Alternative D would have the greatest potential for reducing access to and across BLM-administered lands by identifying the most area for disposal of any alternative (332,500 acres) and making eligible for transfer to the BIA an additional 31,900 acres.

Because the same number of acres would be managed as ROW exclusion, effects on facilities and transportation maintenance from ROW exclusions would be the same as Alternative A. Management of 1,226,100 acres as ROW avoidance would have similar effects as Alternative B on facilities and transportation maintenance.

Effects under Alternative E

Effects on facilities and transportation maintenance from land tenure actions under Alternative E would be similar to Alternative D but would include 20 percent less area identified for disposal (65,300 acres).

Future expansion of the travel network would be restricted in 605,900 acres of ROW exclusion areas and 1,448,200 acres of ROW avoidance areas, which together account for 42 percent of BLM-administered land in the planning area.

Facilities and Transportation Maintenance: Effects from Back Country Byways

Effects Common to All Alternatives

There are no effects common to all alternatives.

Effects under Alternative A

Under Alternative A, impact of the existing Fort Churchill Back Country Byway would be as described under nature and type of effects.

Effects under Alternative B

Under Alternative B, maintenance and expansion of Fort Churchill Back Country Byway and development of the Marietta and New Pass Hawthorne Back Country Byways would result in increased maintenance needs.

Effects under Alternative C

Impacts from the development of Marietta and New Pass Hawthorne Back Country Byways would be as described under nature and type of effects. Declassification of the Fort-Churchill Byway would decrease maintenance in that area.

Effects under Alternative D

The BLM would manage no Back Country Byways in the planning area under Alternative D, reducing the impacts on facilities maintenance compared to Alternative A.

Effects under Alternative E

Impacts would be as described under Alternative B.

Facilities and Transportation Maintenance: Cumulative Effects

Past, present, and reasonably foreseeable future actions and conditions within the cumulative impact analysis area that have affected and will likely continue to affect facilities and transportation maintenance are those that increase the demands for facilities construction and maintenance, increase road maintenance requirements, or that restrict access for maintenance. Impacts on facilities and transportation maintenance from all alternatives would be similar, with variations on the level of access and the required facility maintenance; therefore, the cumulative impacts from all alternatives would also be similar and consistent the nature and type of effects as described previously.

4.7 UNAVOIDABLE ADVERSE IMPACTS

The NEPA, Section 102(c)(i), requires agencies of the federal government to identify and analyze any unavoidable adverse environmental effects as a result of implementing the proposed action. Unavoidable adverse impacts vary between the proposed RMP alternatives and take into consideration protection of resources, while allowing for differing intensities of multiple uses.

Implementation of all proposed alternatives would generate varying levels of surface disturbance open to multiple uses that would create unavoidable impacts. These impacts include surface disturbance that removes and alters vegetation communities, surface disturbance that contributes to fugitive dust emissions, soil loss from wind and water erosion, soil compaction, and surface disturbance that removes, alters, or fragments wildlife habitat. Surface-disturbing activities could affect water resources by reducing water quantity or quality. Restoration would help reduce the degree and intensity of impacts.

Energy and mineral resource extraction would include unavoidable impacts that remove vegetation, leading to changes in vegetation composition and would make areas vulnerable to establishment and spread of invasive plants. Surface disturbance to soils would alter soil horizons and increase compaction. Construction of such facilities as pits, dumps, power lines, and roads, would create visual intrusions to landscape settings changing visual landscapes. Water quantity and quality may be affected from mineral and energy development as a result of drilling or operations.

Livestock and wild horse and burro grazing would include changes in vegetation composition. The health of riparian areas has been affected by livestock trampling stream banks and spring areas as a result of concentrated grazing. Grazing also increases competition for habitat with wildlife.

Recreation use has resulted in loss of vegetation and increased soil erosion, especially in areas of intense recreation use and increased visitation. OHVs have removed vegetation, resulting in increased soil erosion and compaction.

Wildland fire has burned vegetation, impacted soil productivity, and changed species composition of vegetation. Many areas burned have become dominated by invasive annual plants. Fire frequency has increased in these areas. Wildland fire also has and will contribute large quantities of greenhouse gas and particulate emissions.

Continued drought conditions have changed species composition of vegetation, increased the potential for invasive plants to establish and spread, and have weakened trees making them vulnerable to insect infestation and disease. Reduced availability of water within habitat areas have affected plant composition and have altered wildlife habitat use areas.

Irreversible and Irretrievable Commitment of Resources

Section 102 (c)(v) of the NEPA requires a discussion of irreversible or irretrievable commitments of resources. Impacts causing irreversible or irretrievable impacts vary by alternative and generally are the result of uses of the public lands, climate change, and fire.

Irreversible commitments of resources refer to the loss of resources that cannot be regained. Examples are extinction of a species, mined out mineral commodities, and loss of protected cultural resources.

Irretrievable commitments are those that involve the short-term loss of production, harvest, or use of natural resources but can be regained or retrieved over time. Examples include temporary loss of wildlife habitat from removal of vegetation by multiples uses. Use restrictions, mitigation measures, and permit stipulations and adaptive management strategies to address climate change could reduce the degree or intensity of irretrievable commitment of resources.

Minerals and energy development would cause an irretrievable loss of vegetation during operations; however, reclamation of areas would restore vegetation. Minerals and energy development would remove habitat, reducing food and cover for wildlife. Development of facilities, power lines, and roads would also fragment wildlife habitat, change wildlife migration patterns, and displace wildlife in the short term.

Following active operations, wildlife habitat would eventually be restored over time. Irreversible impacts from mineral and energy development are the permanent loss of vegetation and wildlife habitat from the development of mine pits. Loss of unknown cultural resources would also be an irreversible commitment impact due to surface-disturbing activities necessary for development. The loss of historic visual landscape settings would result from mineral and energy developments from placement of permanent features on the landscape, such as waste dumps or pits. The removal of mineral commodities is an irreversible impact as commodities would not available for future uses or to future generations.

Livestock and wild horse and burro grazing could result in an irretrievable loss of vegetation in areas where concentrated grazing occurs. Improving grazing management would help to restore rangeland.

Irreversible commitment impacts from wildfire has burned areas making them vulnerable for establishment and spread of wildfire and have created conditions where ecological thresholds have been exceeded, thereby permanently removing the potential for reestablishment of native vegetation. Climate change has caused irretrievable impact as a result of drought, which has caused changes in plant species composition, allowing more drought-tolerant species to flourish.

Irreversible impact commitments relating to recreation uses would center on OHV travel management. Concentrated use in open use areas may cause permanent loss of vegetation and cause accelerated soils erosion. Areas where non concentrated use occurs would be subject to irretrievable commitments of resources. OHV impacts on vegetation and soils would improve over time in closed or limited travel management areas.

4.8 RELATIONSHIP OF THE SHORT-TERM USES OF THE ENVIRONMENT TO LONG-TERM PRODUCTIVITY

Section 102 (c)(iv) of the NEPA requires an analysis of the relationship between local short-term uses of the human environment and of long-term productivity of resources. Short-term uses result in impacts that are anticipated to occur while the proposed alternative, use, or activity is being implemented, usually within a five-year period. Long-term impacts relate to effects that are anticipated after the first five years but would not exceed the timeframe for the life of the RMP. This period would generally range from 15 to 20 years.

Impacts from short-term uses to long-term productivity would vary by alternative. More long-term impacts would be anticipated from alternatives that emphasize more uses.

Many uses of public lands, such as livestock grazing, mineral and energy development, ROWs, and recreation, have active operations that exceed five years. Consequently, short-term uses center on site-specific short-term events that require SRPs (e.g., motocross racing) or ROWs (e.g., advertising). Impacts from these events would have minimal long-term impacts on long-term productivity as newly disturbed areas would generally be reclaimed under the requirements of the permit or grant. There would be potential for some loss of long-term productivity of the land should short-term activities recur on a frequent or regular basis.

Short-term mineral and energy exploration development would remove vegetation, disturb soils, and remove and fragment wildlife habitat. Impacts on long-term productivity would vary based on the size of surface disturbance. The potential for loss of long-term productivity of rangelands would be greater in lower elevation areas. These areas are more vulnerable to establishment and

spread of annual invasive plant species following disturbance. These invasive plants often outcompete native plants, reducing food and cover sources for wildlife and changing forage available for grazing. A short-term wildfire would permanently affect the productivity of rangeland through alteration of plant species composition, wildlife habitat, and increased soil erosion. Wildlife habitat and rangeland production may not return to pre-fire conditions in the long term, especially in lower elevation areas. Short-term activities that improve, restore, or reclaim areas through seeding; planting and protecting areas would improve long-term productivity of rangeland.